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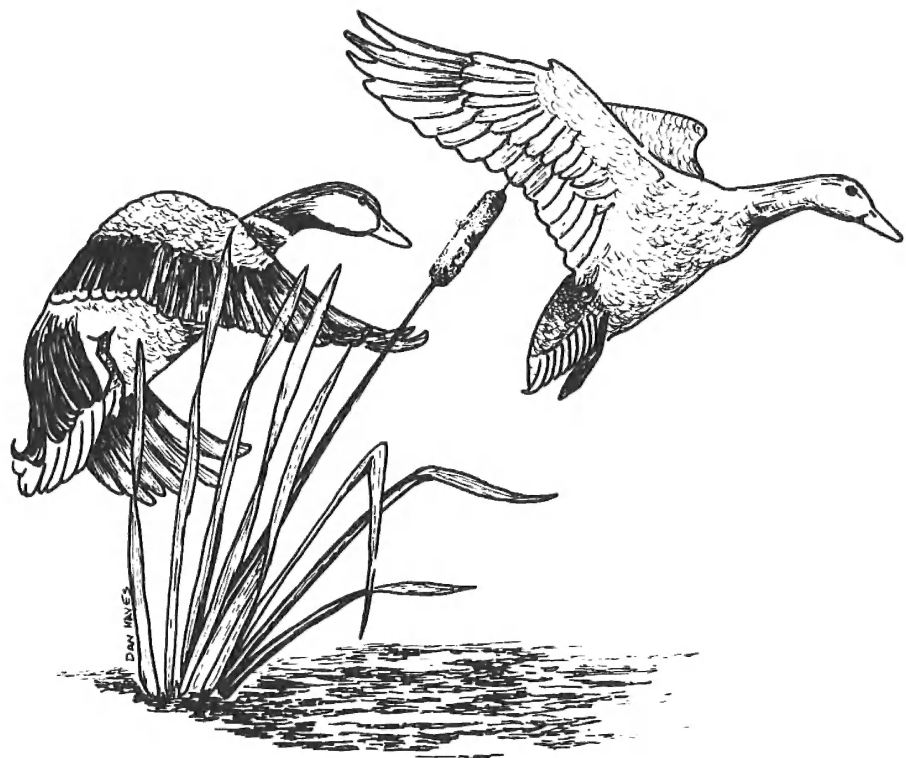
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WATERFOWL STATUS REPORT 1979



UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Special Scientific Report – Wildlife No. 246

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WATERFOWL STATUS REPORT 1979

Compiled and edited by

James F. Voelzer
Elizabeth Q. Lauxen
Sharon L. Rhoades
K. Duane Norman

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FISH AND WILDLIFE SERVICE
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Waterfowl Status Report 1979

Compiled and Edited by

James F. Voelzer, Elizabeth Q. Lauxen,
Sharon L. Rhoades, and K. Duane Norman

U.S. Fish and Wildlife Service
Office of Migratory Bird Management
Section of Waterfowl Population Surveys
Columbia, Missouri 65201

This report contains information from the 1978-79 mid-winter waterfowl survey, the 1979 waterfowl breeding population and production surveys, and the waterfowl harvest surveys for the 1978-79 hunting season. This information was provided by the U.S. Fish and Wildlife Service, the Canadian Wildlife Service, and various cooperating State wildlife conservation agencies. Winter surveys are composed of the midwinter survey reports submitted from each of the four flyways and the midwinter survey covering all of Mexico. The breeding ground surveys section is composed of many individual reports that provide breeding population and production estimates for most waterfowl species within a major portion of their breeding range. The waterfowl harvest survey provides estimates of waterfowl hunting activity and success. Information from surveys of the wintering and breeding populations of waterfowl, coupled with data from the annual harvest survey, are instrumental in developing annual hunting regulations for waterfowl.

Credit has been given to each individual or organization that submitted a report. Although some of the narrative statements have been condensed and a few tables deleted or condensed if they contain data presented elsewhere in this report, the essential information from each report has been retained. The breeding grounds survey strata (Fig. 1) for areas surveyed by Fish and Wildlife Service crews were renumbered in 1974.

Winter Survey

A comprehensive survey of North American waterfowl on their wintering grounds is attempted each January by U.S. Fish and Wildlife Service personnel, assisted in the United States by State conservation departments and private individuals, in Canada by the Canadian Wildlife

Service, and in Mexico by the Direccion General de la Fauna Silvestre.

The U.S. winter survey was initiated in 1933 and, for 14 years, was the only source of extensive inventory data relating to waterfowl distribution and abundance. With the development of spring breeding ground surveys, commencing in 1947, less emphasis was placed on the winter survey. It continues, however, to furnish valuable information.

- The winter survey provides the only direct means of monitoring the status of species not covered adequately by the spring surveys, such as the black duck (*Anas rubripes*) and brant (*Branta bernicla*).

- Winter survey data complement data from the spring surveys for important but less abundant species such as the redhead (*Aythya americana*) and canvasback (*A. valisineria*).

- It helps define the distribution and species composition of wintering flocks. Long-term data give insight into changes in migration patterns and wintering areas.

- Data are frequently used in land acquisition and refuge decisions. It can be argued that waterfowl use is a good indicator of the value of an area.

- Survey data support continuing research efforts by providing an indication of waterfowl distribution and relative abundance.

- Winter survey data are often used in the preparation of environmental impact assessments. The Mexican winter surveys began in the early 1950's and were run annually through 1965, with the exception of 1957. From 1965 through 1976, complete surveys were attempted only once every 5 years. Only black brant (*Branta bernicla nigricans*) habitat on the west coast was surveyed each year from 1965 to 1976. Since 1977, however, complete surveys have been conducted each year. Winter survey data appear in Tables A-1, A-2, and A-3.

The following are summaries of survey reports from the various flyways and Mexico.

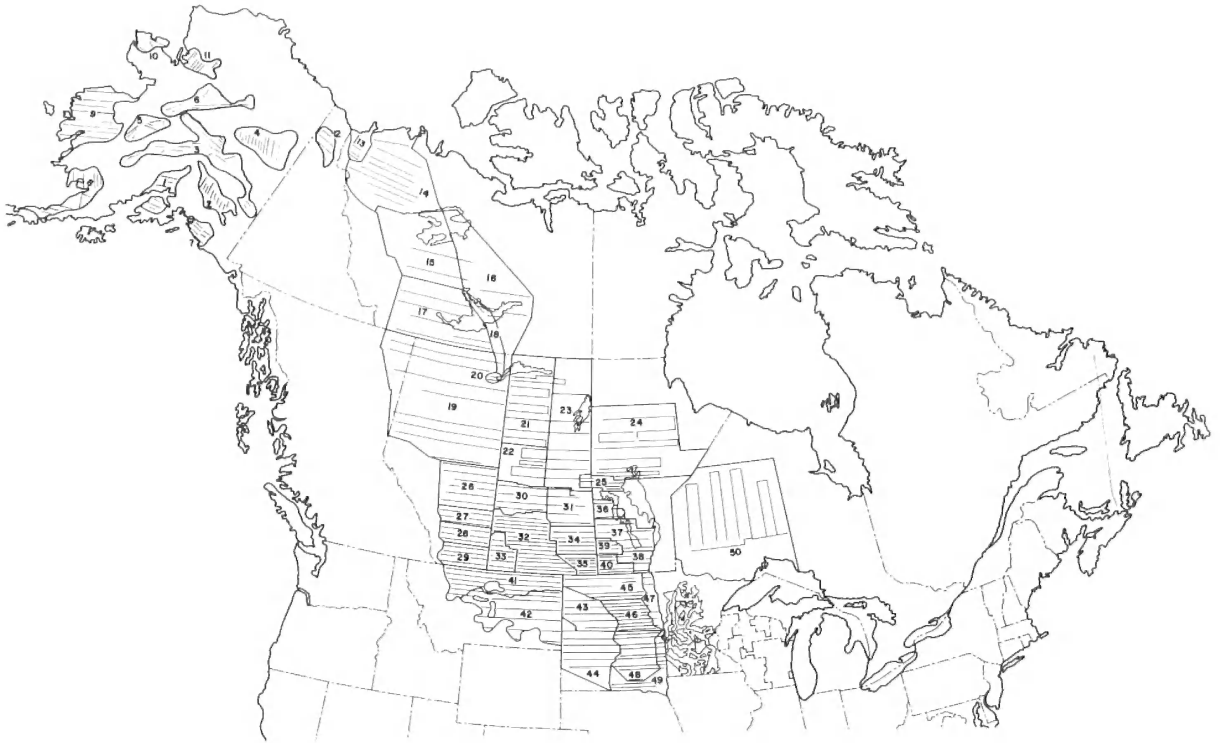


Fig. 1. Transects and strata for aerial waterfowl breeding population and production surveys.

Pacific Flyway

Data supplied by James C. Bartonek
U.S. Fish and Wildlife Service

The annual winter waterfowl survey was scheduled for 2–8 January 1979 but was accomplished during 1–24 January. The west coast of Mexico was surveyed during 11–21 January.

Unusually cold weather during December, coupled with persistent and sometimes deep snow cover, greatly reduced the habitats available to waterfowl in much of Montana, Wyoming, Idaho, Washington, Oregon, Utah, and Colorado. The reduced habitat prompted an atypical departure of birds from these areas before the survey period. In Nevada, habitat conditions continued to improve as water returned to the drought-stricken wetlands, and duck numbers were above those of recent years. In California, waterfowl were scattered because of an abundance of habitat created by rainfall and runoff during the survey period. Storms with rain and fog in the Central Valley prevented coverage from Chico to Red Bluff and in the Sierra Foothills from Modesto to Fresno which are mainly goose areas.

Data for the seven western States entirely within the flyway are compared with those from the previous year's sur-

vey. Border States are not included because this reporting did not distinguish between Pacific and Central flyways, and Wyoming did not conduct a survey. Generally, there was comparable coverage for all States, including California, where efforts in 1978 were affected by dispersal because of rain throughout January. Comparability of 1978 and 1979 surveys with other years, especially for California, may not be valid.

Although the total duck numbers in 1979 differed little from last year (–5%) and the 10-year mean (–5%), there appeared to be continuing decreases in mallards (*Anas platyrhynchos*) when compared with last year (–18%) and the 10-year mean (–31%). Except for snow geese (*Chen caerulescens*), which showed little change from last year, most goose species showed decreases from last year and from the 10-year mean. This decrease could partly be attributed to incomplete survey coverage of the Central Valley of California, but other data suggest a real decline. By species, white-fronted (*Anser albifrons*), Canada (*Branta canadensis*), and cackling geese (*Branta canadensis minima*) declined 67, 15, and 30%, respectively, from 1978. Also, brant decreased 53% from the 1978 survey and 9% from the 25-year mean.

Total participation for 10 States and the west coast of Mexico included 105 personnel, 24 aircraft, and 47 autos covering nearly 56,400 km.

Central Flyway

Data supplied by Harvey W. Miller
U.S. Fish and Wildlife Service

Surveys of geese were conducted 11–15 December 1978, except in Texas where fog and rain delayed completion until 19 December. There were no reports of changes from the methods used or areas covered in 1977. Survey results in Colorado, and perhaps other areas, may have been affected by extensive snow cover and low temperatures that altered feeding patterns and possibly caused some geese to shift to other areas for the winter.

Surveys of ducks, coots, swans, and eagles were scheduled during 2–6 January 1979. Inclement weather delayed completion of the survey until 12 January in Wyoming and 13 January in Texas. Below normal temperatures prevailed in all States before and during the surveys. Open-water areas were considerably restricted in all States; even the Texas coast had some ice. Prolonged, extensive, and deep snow cover made waste grains unavailable in much of Nebraska, Colorado, and States to the north, and could have affected the survey results by altering feeding habits or causing ducks to shift to other areas. The 1978–79 estimates do not include about 15,000 waterfowl observed on areas not previously surveyed.

Information on ducks, coots, swans, and eagles was compiled from summaries of surveys in each State. Detailed records are available only in the respective States. Information on geese is from special surveys coordinated by the Central Flyway Waterfowl Technical Committee, which maintains the detailed records of those surveys.

Survey participation by various agencies included 53 Service and 167 State personnel. Twenty-seven aircraft flew 241 h over 28,481 km, and surface vehicles covered 27,780 km.

Total waterfowl estimates indicated an 11% increase over 1978. Dabbling ducks increased 35% from 1978 and 15% over the 10-year mean. Mallards decreased 29% from the 1978 survey and the mean. Pintail (*Anas acuta*) counts were 215% above last year and 68% above the mean.

Diver estimates were down 31% from those of last year and 38% below the 10-year mean. Redheads declined 40% from 1978 and 47% from the mean, which was the largest numerical decrease in divers. Scaup (*Aythya marila* and *A. affinis*) showed a 45% decline from last year and a 63% decrease from the mean. Canvasback counts were up 35% from 1978 and 233% from the 10-year mean.

Counts were down for all three species of geese in this flyway compared with 1978, but all remained above the 5-year mean. Total geese were 30% below last year and 4% above the mean.

Swan (*Cygnus columbianus*) numbers were relatively unchanged, and coots (*Fulica americana*) increased 35% over 1978.

Mississippi Flyway

Data supplied by Kenneth E. Gamble
U.S. Fish and Wildlife Service

The 1979 survey was scheduled for 2–6 January. Surveys in Region 3 and Region 6 States were conducted during the prescribed period, except for portions of Minnesota, which were surveyed 20–21 January, and parts of Michigan, which were surveyed 9 January. Most of the area was covered with snow and ice during the survey period.

In Region 4 temperatures were well below freezing, and many areas in Arkansas, Tennessee, and Kentucky were frozen. Due to mechanical problems, some survey units in Mississippi were not surveyed. The survey in Louisiana was conducted during 16–22 January. Major lakes and bays in southeast Louisiana and most areas north of Interstate Highway 10 in western Louisiana were not surveyed. Large numbers of mallards in flooded timber in northeast Louisiana made counting difficult. Mallards, pintails, and Canada geese were observed feeding in dry soybean fields in northeast Louisiana.

Participation by various agencies in the flyway totaled 487 individuals. Forty-three aircraft, 317 automobiles, and 25 boats were used to cover 58,802 km. This is a decrease of 19% from the 1976 effort, but compares favorably with the surveys of other years.

Increases in estimates of dabbling ducks compared with 1978 were noted in all species except black ducks and northern shoveler (*A. clypeata*). However, when compared with the 10-year mean, all species decreased except mallard and pintail. Total dabblers increased 20% over 1978 but fell 17% below the 10-year average.

Total diving ducks increased from 1978 (+236%) and the 10-year mean (+19%). These increases were mainly the result of a scaup index that was 460% above 1978 and 22% above the 10-year mean.

Total ducks showed a 36% increase over the 1978 survey but decreased 11% from the mean. Total geese decreased 27% from last year, led mainly by a 35% decline in snow geese. Canada and white-fronted geese were also below the 1978 count, but both remained above the 10-year mean. Coots declined 48% from 1978 and 56% from the mean.

Atlantic Flyway

Data supplied by Warren W. Blandin
U.S. Fish and Wildlife Service

Nearly half the survey flights were made in the week following the survey dates (2–6 January) because of unfavorable weather conditions or mechanical problems. The latest survey was flown on 19 January in New York. Generally mild weather in the weeks preceding the survey left more water open than in the 2 previous years, but

cold, windy days were prevalent during the survey period. Food availability was generally good.

Total waterfowl numbers were 5% above the 1978 level but were 1% below the 10-year mean. Diving ducks, sea ducks, geese, and swans all showed increases compared with the 1978 survey results. However, a substantial decrease in redheads was noted (93,646 vs. 147,649); canvasbacks showed a 23% increase. The diving ducks as a group were below the 10-year mean (-4%), whereas sea ducks were 10% above the 10-year mean; eiders accounted for 63% of the sea duck total. Total duck estimates increased 6% compared with 1978 but were 3% below the 10-year mean.

Goose populations continued to increase in the flyway (+2% compared with 1978), but increases in snow goose (*Chen caerulescens*) estimates were countered by slight declines in Canada goose and brant (*Branta bernicla*) estimates (-1% and -6%, respectively, compared with 1978 estimates). The brant, still at very low numbers, were 53% below the 10-year mean.

Puddle ducks declined 6% below the 1978 estimates and were 5% below the 10-year mean. Black ducks were 12% below last year's estimate and 13% below the 10-year mean. Although a substantial increase in green-winged teal (*Anas crecca carolinensis*) was noted compared with 1978 (+24%), the species is 21% below the 10-year mean. American wigeon (*Anas americana*) estimates for both periods also were substantially reduced.

Of particular interest was the welfare of the New Jersey-wintering Atlantic brant, which were so drastically reduced in numbers during the 1977 winter starvation period (about 80,000 birds lost). Sea lettuce was present in great quantities this year and brant remained in excellent physical condition throughout January. Ice coverage created by a severe cold spell in February had little effect on the brant. Because of their excellent physical condition, the birds (about 30,000) responded by moving south into Chincoteague and Sinepuxent bays in Virginia and Maryland where they remained until early March.

Mexico—East Coast—Rio Grande Delta to Northeastern Yucatan

Data supplied by Arthur Brazda and William Larned
U.S. Fish and Wildlife Service

The waterfowl survey of the east coast of Mexico covered the area from the Rio Grande Delta at Matamoras, State of Tamaulipas (near Brownsville, Texas), to Isla Holbox, located on the northeast tip of the State of Yucatan. The adequate habitat conditions were similar to January 1978, though somewhat drier in a portion of the Rio Grande Delta and in the northern part of the Laguna Madre-Tamaulipas Lagoons unit. Total ducks were up 23% over 1978; dabblers were 63% higher and divers 29% lower. The large number of dabblers was due pri-

marily to the increase in blue-winged teal (+102%), whereas the decrease in divers was the result of substantial drops in redheads (-26%) and lesser scaup (-35%). The Laguna Madre-Tamaulipas Lagoons, Tabasco Lagoons, and the Campeche-Yucatan Lagoons were responsible for 71% of the ducks observed. Total geese increased 36% over 1978; 92% (49,435) were observed in the Rio Grande Delta.

Mexico—Interior Highlands and Lower West Coast

Data supplied by Douglas Benning and Rossaluis Hanson
U.S. Fish and Wildlife Service

The winter waterfowl survey of the Mexico interior highlands and the lower west coast was conducted during 10-22 January 1979. This year's survey was complete and comparable to the 1978 survey. The expanded coverage for Mexican ducks was continued in 1979. Waterfowl habitat was almost normal throughout most of the survey regions; however, above-normal water levels prevailed throughout much of the north central highlands. Overall duck estimates fell below those of 1978 in the interior highlands (-35%) and along the lower west coast (-76%). The Mexican duck estimate was down 36% from 1978. Snow geese were up slightly (+7%) but white-fronted geese were down (23%). Survey data from the Lower West Coast is included in the West Coast totals in Table A-3.

West Coast and Baja California

Data supplied by K. Duane Norman and Bruce Conant
U.S. Fish and Wildlife Service

The survey this year was initiated on 11 January 1979 and was completed on 21 January. The areas surveyed were identical to those surveyed during the last 2 years. A total of 11,755 km were flown in 47:55 hours during the 11-day period. No major changes in waterfowl habitat were observed on the west mainland coast or the west Baja coast since last year. Because of the abnormal rainfall since last fall, many new water areas existed between Guaymas and El Dorado on the mainland and on the west side of Baja; however, waterfowl were not attracted to these water areas. Dabblers decreased (-19%) from 1978, as did the divers (-23%). Total ducks decreased 19% from 1978. Greatest increases in numbers from 1978 were in the scoters, *Melanitta* spp. (+151%), black-bellied whistling duck, *Dendrocygna a. autumnalis* (+107%), wigeon (+10%), and bufflehead, *Bucephala albeola* (+13%). Canada geese, absent for several years, were again observed on the Colorado River delta area. White-fronted geese increased (+77%) from 1978, as did snow geese (+21%). Brant were less numerous in the Tiberon unit, but more than normal numbers were found in the Obregon and Agiabampo units. Brant numbers

were lower than 1978 on Baja; San Quintin had the greatest decrease. Overall, brant numbers decreased 16% from 1978. A decrease is indicated for the mainland (-12%) and for Baja (-18%) since 1978.

Breeding Ground Survey

Aerial surveys of waterfowl breeding populations and production were developed in the late 1940's by the U.S. Fish and Wildlife Service to monitor the status of habitat and waterfowl, primarily ducks, over a large portion of their breeding grounds in North America. Annual information in this regard is essential for effective management of this resource. Waterfowl population and habitat changes are currently surveyed over about 3.4 million km² of breeding habitat within portions of Alaska, British Columbia, Alberta, Saskatchewan, Manitoba, Ontario, the Northwest Territories, the Dakotas, and Montana.

In addition to the Service's annual breeding ground survey, a number of States conduct a similar survey. State reports that have been submitted to the Service are incorporated herein.

Beginning in 1973, the Waterfowl Status Report reflected only the current year's data for Service-conducted surveys. Breeding population survey tables also have been changed to reflect adjustment for visibility bias. All reports before 1973 reflect unadjusted figures. The historical production survey data (1955-71) are available in *Special Scientific Report - Wildlife* 160 (1972). Data for the 1972-78 production surveys are presented in the respective years' status reports. Procedures followed in conducting the breeding ground surveys are established in the Service's standard operating procedures for aerial waterfowl breeding ground population and habitat surveys (1977).

Alaska and the Yukon Territory

Data supplied by James G. King and Bruce Conant
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

As in 1978, all of Alaska from Ketchikan to Barrow, and Old Crow Flats enjoyed an early spring. This reduces stress on early migrants, and large clutch sizes can be expected. No lingering ice was encountered except on the Seward Peninsula and on Old Crow Flats. Emergent grasses were as much as 30 cm high, even on the Yukon Delta, which may have provided unusual cover for dabbling ducks and accounted for part of the indicated decrease. Heavy snow brought water levels up in closed basin ponds, and several rivers (the Innoko, Dalbi, and Acheueelinguk) were still over their banks at survey time. Chris Dau reported from Clarence Rhode Refuge that a 10 June storm surge tide inundated perhaps 25% of brant nests there. Otherwise, weather and habitat conditions

over the entire area appeared optimum. Dirk Derksen reported early conditions on the North Slope and an apparent increase in black brant nests over the past several years.

Breeding Populations (Table B-1)

A return to normal breeding population averages for dabbling ducks in the north is not unexpected, as habitat conditions in the Prairie strata return to normal after drought periods. This year's figures could be slightly biased to the low side due to the early development of emergent grasses in pond margins.

Survey results for dabblers indicate a decrease from 1978 for all species. Notable among them are mallards (-13%), American wigeon (-15%), green-winged teal (-8%), northern shoveler (-50%), and pintail (-26%). Total dabblers were down 22% from 1978.

All diving ducks showed an increase over 1978 except scaup and oldsquaw (*Clangula hyemalis*), possibly reflecting good production last year. The decrease in scaup (-9%), however, was substantial enough to cause a 2% decrease in total divers. Miscellaneous ducks decreased 16% compared with 1978, and total ducks also decreased 16% from last year.

Compared with the 10-year mean, dabblers increased 1%, divers showed no change, miscellaneous ducks increased 14%, and total ducks increased 3%.

Favorable nesting conditions were reported for geese on the Yukon Delta. Most nesting efforts were comparable to last year's, except for white-fronted geese, which seem to be disappearing from previously occupied habitats. Concern for the Pacific Flyway white-fronted geese is growing throughout their range, as indications of a population decline mount. Tidal flooding caused some damage to coastal nests of black brant, emperor geese (*Anser canagica*), and white-fronted geese for the second year in a row. Black brant were down 16% in the 1978-79 winter inventory following a nesting season that seems to be identical to the 1979 effort, including tidal flooding.

Northern Alberta, Northeastern British Columbia, and the Northwest Territories

Data supplied by Morton M. Smith, K. Duane Norman, and Carey S. Smith
U.S. Fish and Wildlife Service
and

Vernon D. Stotts, Maryland Wildlife Administration

Spring Weather and Habitat Conditions

The winter of 1978-79 was very cold throughout the survey area of northern Alberta, northeastern British Columbia, and the Northwest Territories (all hereafter termed the NWT). The low temperatures and less than average snow cover in some areas resulted in a heavy ice cover on lakes and rivers. Spring was cold and late in the

NWT, except in the lower (northern) Mackenzie Valley. In southern and eastern portions of the unit, 1979 was the latest spring in our survey experience. In the northern strata, however, much less ice was encountered this year than during the spring of 1978. The season in the northernmost areas in 1979 was considered normal to early.

Breeding Populations (Table B-2)

Total duck numbers in the NWT were 24% above those recorded in 1978 and 30% above the 10-year mean. A small decline (-5%) in dabbling duck numbers in 1979 was more than offset by increases in diving ducks (+26%), and a large increase (+79%) in the miscellaneous group was made up largely of sea ducks.

Among dabbling ducks, mallard numbers in 1979 increased 14% over 1978, and were 11% above the long-term mean. The numerically important wigeon decreased 26% from 1978 levels and were 9% below the 10-year mean. Green-winged teal showed little change in numbers (-5%) from 1978 but remained above (+40%) the 10-year mean. Scaup are the most numerous duck in the unit, and current numbers were 33% above 1978 and 15% above the 10-year average. Bufflehead (*Bucephala albeola*) numbers changed little from 1978, whereas ring-necked ducks (*Aythya collaris*) declined. Redheads and canvasbacks occur infrequently in the survey unit, and our estimates of their populations have wide confidence limits.

Large increases were recorded in sea duck numbers, primarily as a result of a great increase in oldsquaw (248% above 1978 and 182% above the 10-year mean). Scoters increased 17% above 1978 and were 50% above the 10-year mean. Mergansers (*Mergus serrator* and *M. merganser americanus*) decreased from 1978 but were double the mean levels.

Coot numbers were very low in the survey area in 1979. Geese are recorded when encountered, but our surveys are not designed to measure the breeding populations of these birds.

Northern Saskatchewan, Northern Manitoba, and the Saskatchewan River Delta

Data supplied by Arthur R. Brazda, James R. Goldsberry, William E. Larned, and Al Novara
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

Habitat conditions can be summed up as good to excellent in all areas except the southwest portion of the survey area. In the southwest, both stations closely associated with this unit, Cold Lake and Meadow Lake, reported below normal or near normal precipitation levels for the period 1 August 1978-31 May 1979 (Cold Lake -39% and Meadow Lake -0.4%). It should also be noted that precipitation at both of these stations was below normal for the period 1 November 1978-31 May 1979.

Spring was at least 2 weeks later than normal in all strata. Actually, it appeared to be considerably later than indicated because of the persistent heavy ice conditions on the larger or deeper lakes, even in the more southern strata. However, when conditions progressed enough for initiation of the survey, breeding activity was well along, and only the scaup appeared to be abnormally bunched up. Ice still remained on most of the larger lakes to the north, and vegetative development of the dwarf birch, willow, and aspen was almost nil until the last week of the survey. In northern Manitoba, winter conditions remained until late May. However, the chronology of mating activities was close to normal; in fact, Canada geese appeared to be ahead of the previous year, though no broods were observed.

Breeding Populations (Table B-3)

It appears that the more lucrative habitat conditions in the prairies in 1979 short-stopped some of the waterfowl possibly destined for the breeding areas farther north, although there was inconsistency in the pattern by species. For example, mallards decreased markedly from 1978 in Strata 22, 23, and 25, dropped only 6% in Stratum 21, and were up 15% in Stratum 24. Wigeon increased slightly in Strata 21 and 22 and indicated decreases in the remaining three strata. On the other hand, both species of teal dropped in all strata. Overall, dabbling ducks decreased 25% from the previous year but remained 8% above the 10-year mean. Divers increased 15% and 12%, respectively. However, of the major diving duck species, only the lesser scaup indicated an increase. There was reason to believe that this increase was in error and was directly the result of the slow disappearance of the ice conditions farther north. The miscellaneous duck category decreased 41% from 1978 and was 2% below the 10-year mean. Canada geese were 26% below the previous year, and 109% higher than the long-term mean.

In the dabblers, mallards were 13% below 1978 and 12% above the 10-year mean; pintails, -59% and -53%, respectively; green-winged teal, -27% and +77%; blue-winged teal (*Anas discors*), -48% and -33%; American wigeon, -24% and -13%; gadwall (*Anas strepera*), -29% and -45%; and shovelers, -44% and -48%.

Important diving ducks fared as follows: redheads were down 43% from the previous year and were down 61% from the 10-year mean; canvasbacks, -39% and -52%, respectively; scaup, +52% and +47%; ring-necked ducks, -35% and -34%; goldeneyes (*Bucephala clangula americana*), -28% and -43%; and buffleheads, -2% and +26%.

In the miscellaneous ducks, ruddy ducks (*Oxyura jamaicensis rubida*) decreased 50% from last year and were down 46% from the mean; mergansers, -46% and -3%, respectively; and scoters, -5% and +14%.

Canada geese were again observed in all strata and indi-

cated a 26% decrease from 1978, but they remained 109% above the 10-year mean. Coots were down substantially, 64% and 67%, respectively.

Summer Weather and Habitat Conditions

The extremely long, cold winter was responsible for one of the latest ice breakups on record. Consequently, the spring season was about 3 weeks later than normal, resulting in very late nesting activities. Except for the Meadow Lake region, Stratum 22 rainfall was adequate in May and the first half of June. The remainder of June and all of July were dry in the North, and the northern portions of Strata 21 and 23 were subjected to numerous forest fires.

In the four strata surveyed during the production survey, the Meadow Lake portion of Stratum 22 continued to be dry and habitat conditions were only fair to poor.

In Strata 23, 25, and the southern half of Stratum 24, habitat conditions were good. However, the northern half of Stratum 24 had high water levels, and nest destruction due to flooding appeared to have been a serious problem. As a result, the incidence of flocked mallard females was frequent. Groups of 5 to 15 mallard hens were observed on several occasions.

Production (Table B-3)

The duck brood index for the four northern strata, 22-25, was 95,000. Stratum 21 was deleted because of survey time limitations. When comparing like strata, these data indicate an 8% increase over 1978; however, a 30% decrease was indicated for 1979 from the 10-year mean.

Except for Stratum 25, scaup and ring-necked duck broods were just becoming evident at the conclusion of the survey. Several Class I dabbling broods were also observed during the last few survey days. Of 193 identified broods in 1979, 117 (60%) were Class I. This compares with 47% in 1978 and 28% in 1977. These data support inferences made concerning the tardiness of the nesting season.

The Class II and III average brood size of 4.3 was the lowest recorded in the past 13 years, which is the time span for which comparative data are available. When comparing like strata, the brood size of 4.3 is 14% below 1978 and 23% below the long-term mean. In two strata, the average brood size was less than 4.0 ducklings (Stratum 23, 3.6 and Stratum 24, 3.9). It appears that many of the Class II and III dabbling broods observed were definitely victims of the cold, late spring.

The coot brood index for the comparable strata was 4,000, which is a 33% decrease from the previous year and -67% from the mean.

The number of Canada goose broods was low. Only two broods were observed in Stratum 22 and one in Stratum 23.

Considering only comparable strata, the mallard late nesting index (LNI) was 61% above 1978 and 138% above the 10-year mean. For all remaining dabblers, the LNI de-

creased 19% from 1978 and 29% from the mean. Collectively, divers were 68% above the previous year and 9% above the 10-year mean. The true value of the LNI is unknown. In these strata, the value of the LNI has to decrease markedly and should be given only minor consideration.

Southern Alberta

Data supplied by K. Duane Norman and Carey S. Smith
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

In stratum 29, waterfowl habitat was extremely abundant from the U.S. border north to a line between Lethbridge and Medicine Hat. North of this line the habitat became much drier. Temporary water areas had dried, but the more permanent wetlands had adequate water. The pond index in this stratum was 22% below 1978 but was still 18% above the mean.

In stratum 28, the grasslands east and northeast of McGregor Lake were dry. It was also dry south and east of Tilley, but the Ducks Unlimited island complex and projects contained adequate water levels. The habitat east of Calgary was about normal. Crowfoot Creek again contained excellent habitat. The Empress-Oyen area was fairly dry. The data indicated a 15% decrease in ponds from 1978 and a 30% decrease from the mean.

Northward to stratum 27, water conditions were good east of the Wintering Hills, but a high percentage of the available water was temporary. West of the Hills, the habitat became dry. South of Olds, the wetlands were slightly better than normal. Ponds in the Sandhills contained adequate water in 1979. The Bullpound drainage had good habitat and changed little from 1978. Type III wetlands were abundant from Hanna to Youngstown. Sounding Creek east and west of the reservoir contained good nesting habitat, but that near the Saskatchewan border was much poorer than in 1978. The area between Grassy Island Lake, which was dry again in 1979, and Kirkpatrick Lake was much drier than in 1978. The Chain Lakes and Farrell Lake again had water, but the levels were low. The knob and kettle habitat north of Three Hills contained excellent water. There was definitely more habitat available there than there were ducks. The pond index showed a slight increase of 3% from 1978 but a 42% deficit from the mean.

In stratum 26, wetlands for the most part have almost fully recovered from the drought between Rocky Mountain House and Stettler. The wetlands near Coronation were good, but water levels were low. Sounding Lake was drier in 1979 than it was in 1978. The area east of Buffalo Lake and the sandhills south of Wainwright had good habitat—the best in many years. The Viking Moraine usually contains good habitat; 1979 was no exception, and water levels were well into the woody vegetation. Much of

the available water east of Vegerville was of a temporary nature but became good northwest and north of Vermillion. The pond index in this stratum had increased 55% from 1978 but was still 18% below the mean.

Overall, the pond index was 19% above 1978, primarily because of the substantial increase in water in stratum 26, but was still 20% below the mean.

Breeding Population (Table B-4)

Results of the 1979 survey indicated a measured improvement in total ducks from 1978; the index was only 7% below the mean. Puddle ducks showed the greatest increases (+26%) from 1978 but were still about 11% below the mean. The divers, influenced heavily by scaup, showed a 16% increase from 1978 and an increase (+24%) from the mean.

Of the puddle ducks, blue-winged teal (+51%) and pintail (+34%) showed substantial increases from 1978. Moderate increases were indicated for gadwall (+24%), wigeon (+33%), mallard (+19%), and green-winged teal (+16%). Shovelers showed a decrease of 4% from 1978.

Of the divers, only scaup (+48%), bufflehead (+11%), and scoter (+39%) showed population increases from 1978. Goldeneye numbers decreased (-77%), as did mergansers (-65%), ring-necked duck (-58%), ruddy duck (-52%), canvasback (-39%), and redhead (-25%) from 1978.

Coots increased 148% from 1978 and are 25% above the mean.

Canada geese were still on the increase in southern Alberta, and showed a 22% increase from 1978 and a 34% increase from the mean.

A look at the 10-year mean revealed that only wigeon (+2%), pintail (+7%), scaup (+56%), bufflehead (+57%), and scoter (+120%) populations were above the mean. All other species showed various decreases. Those which were significant were mallard (-31%), blue-winged teal (-18%), redhead (-37%), and canvasback (-32%).

Summer Weather and Habitat Conditions

Temperatures during May averaged from 1 to 2° below normal throughout most of Alberta. The first and last weeks in particular were colder than normal, and several record daily minimums were recorded at a number of stations. Late frosts were fairly widespread during the last days of the month. In spite of the cool, unsettled conditions, the amount of precipitation received was near normal throughout the Province. Above normal snowfall occurred along the foothills from Pincher Creek to Whitecourt and north of a line extending from Fort St. John to Grand Prairie, Whitecourt, and Coronation to Medicine Hat.

Temperatures during June were nearly normal throughout most of Alberta. Early June was unseasonably cool; a

number of stations established new record daily minimums. By mid-June, however, temperatures had recovered and by the end of the month, new daily maximums were being recorded in the central and northern areas of Alberta. Total rainfall during the month ranged from 15 mm at Lethbridge to 160 mm near Whitecourt. The Edson-Whitecourt-Slave Lake area was the wettest region in the Province during June. Northeastern Alberta and the southern grasslands were considerably drier than normal. Rainfall elsewhere was variable and depended upon the frequency and intensity of the thunderstorms. The lack of rain in June (normally the wettest month), coupled with warm dry winds, seriously depleted the surface and soil moisture. Hay and cereal crops suffered because of the lack of adequate moisture.

Pond indexes revealed a 26% decrease in the survey area since May 1979. Greatest losses were indicated in stratum 27 (-42%) followed by stratum 29 (-36%), stratum 26 (-21%), and stratum 28 (-19%). Only stratum 26 showed an increase in water from 1978 (+41%). Slight decreases from average were noted for the survey area, but increases were shown for strata 28 and 29.

Production (Table B-4)

For 1979, the Alberta duck brood index decreased 2% from 1978. The index is still 16% above the mean. Decreases were noted from 1978 in all strata except stratum 29, which increased 59%. The number of broods decreased 21% in stratum 26, 8% in stratum 27, and 8% in stratum 28. The average brood size decreased (-7%) from 1978 to 5.1 ducklings per brood. Coot production increased (+36%) from 1978 in southern Alberta. All of the increase (+83% from 1978) was in stratum 26. Decreases of 29% were indicated in stratum 27, 28% in stratum 28, and 17% in stratum 29.

A look at the brood classification revealed that 44% of the broods in 1979 were Class III, 29% were Class II, 17% were Class I, and 10% were unidentified.

The late-nesting index of 117,100 represented a 7% increase from 1978 and an 18% increase from the mean. Changes of significance from 1978 were found in mallard (-15%), gadwall (+26%), wigeon (+11%), green-winged teal (+66%), blue-winged teal (-29%), and scaup (+36%). Although not of great importance, the index for redhead decreased (-31%) from 1978, whereas canvasback increased (+100%).

Southern Saskatchewan

Data supplied by Douglas Benning, Rossalius C. Hanson, William Larned, and Albert Novara
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

Total precipitation during September-May was above normal at all stations with the exception of Kindersley, which was slightly below normal.

During the first week in May, snow showers, overcast skies, and temperatures around the freezing level were common. Overnight lows reaching -4°C during the first week of May could have had adverse effects on early nesting attempts. Two widespread snowstorms during the last week in April and the first week in May deposited as much as 15 cm of new snow each in a wide swath oriented north-south through Prince Albert and Moose Jaw south to the U.S. border, extending west to a north-south line through North Battleford and Swift Current, and extending east to a north-south line somewhat east of Regina. This also would have adversely affected early nesting attempts in progress.

Visible vegetative growth was delayed by as much as 2 weeks throughout most of southern Saskatchewan; it was delayed in the southwestern part of the Province to a lesser extent. Visibility of waterfowl during the aerial survey was not affected by leafing of trees and shrubs and the growth of aquatic vegetation.

The May pond count indicated an overall increase of 42% from 1978, with increases of substantial proportion in strata 30, 31, 32, and 35. Compared to the previous 10-year mean, May ponds were 37% above normal, and increases were indicated in all strata.

Upland nesting cover was in short supply as usual in most agricultural areas of southern Saskatchewan in the spring of 1979. Intensive cultivation and increased cattle densities on rangelands in recent years placed unprecedented pressure on prairie-nesting ducks to seek out adequate safe nesting cover which would remain intact long enough to hatch their broods. Spring provided some relief because delayed thaw, late snowstorms, and above-average precipitation in late April and early May caused farmers to delay their cultivation and other farming activities 1 to 2 weeks throughout most of southern Saskatchewan. It was reported that farmers were not going to seed this year because some areas were too wet. Other detrimental activities such as fall-spring burning of stubble and nesting cover adjacent to wetlands, fall haying, and expansion of drainage systems were minimal in 1979 because of unusually wet conditions.

Breeding Populations (Table B-5)

Comparing the 1979 population estimates with those of 1978, total ducks increased 41%; dabblers increased 39%, divers 51%, and other ducks 109%. Of the dabblers, significant increases were indicated for blue-winged teal (+64%), pintail (+64%), northern shoveler (+62%), green-winged teal (+53%), American wigeon (+27%), gadwall (+21%), and mallard (+17%). Among the divers, significant increases were indicated for goldeneye (+154%), canvasback (+118%), scaup (+51%), and redhead (+24%). Significant increases were also indicated for scoters (+372%), mergansers (+100%), and ruddy duck (+98%). The American coot, responding almost predictably to changing water conditions,

increased 202%. The Canada goose estimate had an indicated increase of 21%.

Comparing 1979 population estimates with the 1969-78 means, total ducks indicated a 3% increase; dabblers decreased 3%, divers increased 58%, and miscellaneous ducks increased 53%. By species, significant increases were indicated among scoters (+268%), mergansers (+257%), scaup (+97%), goldeneye (+89%), ring-necked duck (+75%), gadwall (+62%), bufflehead (+51%), ruddy duck (+39%), green-winged teal (+38%), and canvasback (+30%). Significant decreases were indicated among pintail (-14%), blue-winged teal (-14%), and mallard (-13%). The American coot increased 56% from the mean. The Canada goose estimate had an indicated increase of 76%.

The lone drake index in 1979 for the mallard, pintail, and canvasback combined was 78.9, which is close to the 1956-78 mean for this survey unit.

Summer Weather and Habitat Conditions

Weather patterns over southern Saskatchewan during late May, June, and early July were hot and dry. This was in sharp contrast to the late spring in 1979, which was generally cool and wet. The lack of normal amounts of precipitation and warm afternoon temperatures spurred by frequent strong surface winds served to reduce surface water rapidly through this period. Temperatures reported at 12 stations around the survey area often exceeded 2 and 3° C above normal during mid-June and early July and precipitation accumulations were below normal amounts received since late May in most areas. In the northwest region of this survey reporting unit (stratum 30), however, accumulated precipitation during this same period was above normal. Precipitation accumulations for the growing season between 1 April and 16 July as reported by these stations were generally below normal in strata 31, 34, and 35, somewhat above normal in stratum 32, and well above normal in stratum 30.

The July pond index, obtained as a part of this survey, indicated an overall 65% decrease in the number of ponds from the comparable index obtained during the May survey. This decrease was substantially greater than the 50% loss experienced in more normal years.

The July pond index was 22% above 1978 but 9% below the previous 10-year mean. Strata 31 and 32 were appreciably drier than normal, whereas all other strata were little changed from the mean.

Upland nesting cover was relatively dense resulting from this year's abundant surface moisture when spring finally arrived in the region. With few local exceptions, crops appeared to be in very good condition across the prairies and mixed prairie-parklands of Saskatchewan during July, and the grasslands of southwest Saskatchewan appeared to be in excellent condition. Overall upland nesting habitat for renesting and late nesting species was better than average. Early nesting was probably adversely

affected with the delayed spring. The rapid drying conditions experienced soon after cover growth was established in May provided temporary cover for early nesters on farmlands; however, farmers were in the fields much sooner than expected and destroyed many early nests. Overwater nesters probably suffered from the rapid drying and lowering water levels during June and July. During the survey broods and late-nesting waterfowl were observed in Type IV and V wetlands where good brood cover was found. The probability of successful late hatches was forecast to be good and brood survival high.

Production (Table B-5)

The total brood index for southern Saskatchewan was 18% below 1978 and 28% below the previous 10-year mean. The distribution of broods by age classification in the observed broods was as follows: Class I, 224 (38%); Class II, 188 (33%); Class III, 139 (25%); and unidentified Class, 27 (4%). The average brood size of intact Class II and III broods observed by the survey crew was 5.3 ducklings. This was above the 1978 average brood size of 4.7 and slightly above the 10-year mean of 5.0. The coot brood index was 20% above 1978 and 10% above the 10-year mean.

The late-nesting index, which is a measure of broods yet to hatch after the survey, was about 2.7 times as large as the duck brood index. This index was 50% above that of 1978 and 20% above the previous 10-year mean. Dabblers were up 44% from 1978 and up 6% from the mean. Divers were up 79% from 1978 and 88% above the mean.

Southern Manitoba

Data supplied by William Larned and Albert Novara
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

Above-normal precipitation over the entire survey area and spring temperatures averaging several degrees below normal provided conditions more than adequate to recharge the soil moisture deficit of the past 2 years. This left the ground saturated at the end of May, with most basins full and sheet water still common in fields. In many areas, planting operations had not been initiated by this time. This was particularly true in stratum 38 where heavy flooding of the Red River and tributaries had persisted until about 20 May and in most of the marginal farmlands to the north where a late planting date can mean crop disaster.

Additional agricultural impacts on habitat during 1979 were minimal, probably due to inclement weather. Very little new clearing and burning activity was observed during the survey. However, it must be noted that after the dry year of 1977, and to a lesser extent 1978 which still saw dry soil conditions, there was not much left to be cleared. Extensive draining was attempted during 1979

but filling operations were not common.

Nesting cover, so vitally important in minimizing the effects of predation on waterfowl production, was generally in short supply and poor in quality in Southern Manitoba. However, increased pond numbers and the late starting dates of agricultural activities helped to minimize nest disturbance.

Breeding Populations (Table B-6)

Population estimates of all individual species of dabblers increased significantly from those of 1978, and total dabblers increased 39%. With the exception of teal and shoveler, estimates of all dabblers now equal or exceed the 10-year mean. Mallard estimates increased a substantial 24% from those of 1978 and 2% from the 10-year mean. Gadwall and American wigeon showed increases again during 1979, which put their estimates well above the 10-year means. Blue-winged teal estimates are back up to respectable levels after two low years, and pintail showed sharp increases in all strata, more than doubling their numbers from 1978 and exceeding the 10-year mean by 10%.

Data reveal that the sharp decline in scaup numbers is largely responsible for the 1979 decrease in diving duck totals. Summary data from 1978 and 1979 indicate that observed numbers of scaup drakes and pairs are very similar (280 and 289, respectively) but the large numbers of grouped birds observed in 1978 are missing from the 1979 data (1,093 in 1978 vs. 174 in 1979). It is suspected that these large flocks were transients, and that the late survey starting date in 1979 gave migrant flocks time to move on through the area.

Redhead and canvasback have increased substantially from 1978, although neither has attained average levels. Coot estimates decreased by 35% from those of 1978 and 38% from the 10-year mean. This is surprising in view of the coot's reputation for taking advantage of good water supplies in the prairies.

The weather did not permit survey initiation until 17 May. Lone drake indices coincided almost exactly with the 23-year means for mallard, pintail, and canvasback and seemed to support our starting date, which was nearly 2 weeks later than normal.

Summer Weather and Habitat Conditions

In violent contrast to the cold, wet spring in southern Manitoba, June and July were abnormally hot and dry. Rainfall after May was very spotty, coming almost entirely from widely scattered thunderstorms, and has been below normal nearly everywhere. The six reporting stations within the survey area have reported precipitation from 24 to 62% below normal for the period. Temperatures were unusually high the last half of June, and averaged 4 to 5° C above normal the first 3 weeks of July. These conditions, combined with almost constant dry winds, resulted in a rapid decline in soil moisture and

pond levels. July pond estimates indicated an overall decrease of 58% from those of May; stratum 39 suffered the greatest loss (67%). Results still compared favorably with those of 1978 (6% increase) and were only 6% below the 10-year mean. Additional water losses, however, occurred at a rapid rate through the survey period and afterward, and no doubt the situation was worse than the figures showed.

Production (Table B-6)

The duck brood index dropped considerably from that of 1978 (-37%) but remained above the 10-year mean. The mean brood size of 5.2 compared favorably with that of 1978 (+5%) and was essentially unchanged from the mean (-4%). The coot brood indices showed an insignificant 4% decline from both 1978 and mean figures.

In spite of the crew's optimism in May, a predominance of Class I broods in the sample strongly indicated a poor early hatch and brood survival. The unusually cold and wet spring could have caused any or all of the following problems, which in turn could account for this observed result: reduced hatchability of eggs resulting from cooling or freezing; increased mortality rates of newly hatched ducklings due to exposure; a change in normal breeding behavior due to environmental stress; and stress-induced changes in predator behavior. In addition, the rapid and nearly complete disappearance of water in areas where shallow water was abundant in late May may have had a disastrous effect on early broods. Although there are countless variables in any year which can affect waterfowl production, it seems logical to assume that the extreme weather conditions had a strong negative effect on early broods.

The LNI provides a rough measure of broods yet to come. The total LNI of 50,700 represented increases of 18% from that of 1978 and 57% from the 1969-78 mean. This is consistent with the apparently poor early hatch and the relatively large number of young broods observed in July.

Individually, the mallard LNI remained virtually unchanged from 1978 and was 25% above the mean. Gadwall and American wigeon indices increased considerably during both time frames, but those of green-winged teal and pintail decreased significantly from 1978. The total dabbling duck LNI increased 5% from 1978 and 50% from the mean. All diving duck species showed increases from both references; scaup was numerically most important. The LNI for total divers was up 82% from 1978 and 163% from the 10-year mean.

Montana

Data supplied by James F. Voelzer and John Tautin
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

Three factors—above normal precipitation, below nor-

mal temperatures, and abundant residual nesting cover—combined to provide prime breeding habitat over the entire survey area. Because of the wet spring, farmers were unable to work their fields in the northwest quadrant of the survey area, and as a result numerous stubble fields with leftover grain served as a generous attraction for a record number of waterfowl. Our prime concern was that continued low temperatures might retard the development of adequate brood cover.

Breeding Populations (Table B-7)

Indices for blue-winged teal, northern shoveler, pintail, and scaup indicated the highest breeding population for those species in Montana since surveys were initiated in 1965. Statistics for these and other important species compared with 1978 and the 1969-78 mean, respectively, are as follows: Mallard, +38% and +1%; gadwall, -28% and +61%; American wigeon, -4% and -11%; green-winged teal, +120% and +65%; blue-winged teal, +199% and +98%; northern shoveler, +57% and +224%; pintail, +45% and +115%; redhead, +110% and +456%; canvasback, +64% and +74%; and scaup, +83% and +163%. Total ducks increased 45% over 1978 and 66% from the mean.

The 1979 lone drake index of 77.4 (mallards 76.7 and pintail 78.3) indicated a nesting season slightly more advanced than normal.

The Canada goose index should be considered as a trend figure only. More intensive and timely goose surveys were conducted by the Montana Department of Fish and Game and by the Service's Division of Wildlife Refuges.

Summer Weather and Habitat Conditions

During the May 1979 survey, nesting habitat, although delayed somewhat by a late spring, reflected abundant residual nesting cover and excellent water quality. Total water areas had increased 67% compared with May 1978 and were 38% above the 10-year mean. New growth was retarded but the July survey indicated sufficient brood cover was available. Habitat conditions, however, deteriorated markedly since May. Growth of upland cover and cereal grains was very sparse. Crop yields were anticipated to be 7% below 1978. Water areas were equal in number to those encountered in July 1978, 19% above the 10-year mean, but 35% below the May 1979 survey. Lack of rainfall since May was the main reason for the decline of water areas, and an unseasonably cool spring and generally poor growing conditions was responsible for the poor growth of upland cover.

Production (Table B-7)

The 1979 brood index of 104,300 was the largest such index for Montana since production surveys were initiated in 1966. It was 44% above the 1978 index and 115% above the 10-year mean. The mean brood size of 5.3 was 3% above 1978 and 2% above the 10-year mean.

A breakdown of the brood age classes by stratum indicated that nesting conditions and hatching success were similar over the entire survey area, and that early nesting attempts were successful.

The late nesting index of 8,400 was the second lowest (5,400 in 1977) since the beginning of surveys in 1966. A late spring, coupled with deteriorating habitat, and successful early nesting attempts provided little chance of any significant late nesting success.

North and South Dakota

Data supplied by Edgar Ferguson, Ted Heuer,
James F. Voelzer, and John Tautin
U.S. Fish and Wildlife Service

Spring Weather and Habitat Conditions

In North Dakota, above average precipitation in the spring followed by continual rainfall during and after the survey resulted in excellent marsh habitat throughout most of the State. Pond counts increased 54% over 1978 and 12% were above the 10-year mean.

In South Dakota, slightly less favorable habitat conditions occurred. In western South Dakota, there were 20% fewer ponds than 1978 and 17% fewer than the long-term mean. The southeast portion of the State had 18% more ponds than in 1978 and was 28% above the 10-year mean. Total ponds decreased 14% from 1978 and were 4% below the mean.

Breeding Populations (Tables B-8 and B-9)

In North Dakota, mallards increased 35% from 1978 and were 20% above the long-term mean. Pintails decreased 5% from last year but were still 8% above the mean. The canvasback estimates of 64.4 thousand were the highest in the past 10 years. The spectacular numbers of coots (1.4 million) were thought to reflect the habitat conditions in North Dakota.

In South Dakota, all species except bufflehead, coot, and Canada geese decreased in relation to 1978. Mallard and pintail were slightly above the long-term mean. The coot index was 62% above 1978 and remained 157% above the mean.

As there were higher proportions of lone drakes in South Dakota, it was presumed that the nesting season was more advanced than in North Dakota. Since neither index differed by more than 5% from the previous year, this would indicate little change in breeding phenology between the two years.

Summer Weather and Habitat Conditions

Precipitation for May and June in both States was below normal, especially in the western portions, which caused a reduction in the number of ponds and created lush vegetation on the remaining pothole habitat. Some overwater nesting species may have benefited from generally favor-

able vegetation on the potholes, but brood visibility was down considerably from "normal" years. Pond counts in North Dakota increased 38% from 1978 but were 8% below the mean. Ponds in South Dakota decreased 13% from 1978 and 14% from the 10-year mean. Ground studies in North Dakota supported a dismal prospect for future waterfowl production because of the decline in quality of the habitat base. Only major changes in land use can reverse this trend, and the outlook for such a change was not optimistic.

Production (Tables B-8 and B-9)

The duck brood index in North Dakota of 30,700 was a decrease of 18% from 1978 and 25% from the mean. This decrease may have been a result of the lush emergent pond growth and the resulting difficulty in brood observation. This held true for South Dakota also, where the brood index decreased 37% from 1978 and 11% from the 10-year mean. Total late-nesting indices for North Dakota are down 50% from last year and 75% from the mean. A similar pattern was observed in South Dakota where late-nesting indices decreased 61% from 1978 and 61% from the 10-year mean.

Minnesota

Data supplied by Robert L. Jessen
Minnesota Department of Natural Resources

Information concerning duck breeding populations in Minnesota is contained in Tables B-10 and B-11.

California

Data supplied by J. LeDonne, F. Kozlik,
H. George, and D. Hinz
California Department of Fish and Game

Weather and Habitat Conditions

Habitat conditions in northeastern California were generally drier in 1979 than in 1978. Some areas have still not recovered from the drought years of 1976 and 1977. Most of the permanent water areas held enough water for this breeding season; however, the temporary waterfowl habitat was almost nonexistent. There were isolated areas in this region that received enough runoff to produce good nesting and brooding conditions for ducks and geese, but this habitat made up only a small portion of the overall area.

The Central Valley received above normal amounts of rainfall and this, together with the runoff from the snowpack in the Sierra Nevada Mountains, filled the State's reservoirs and caused some spillage through the Sacramento River weirs. However, there was not the extensive flooding of lowlands that occurred in late winter and spring of 1978. The Central Valley is mostly composed of

artificial and regulated water impoundments such as rice fields, grasslands, and pastures. Rice-field preparation was behind schedule, mainly due to the all-time record of 217,000 ha planted this year in the Central Valley.

Farm ponds, stock tanks, and other small wetland areas scattered over the entire State and not covered by this survey were full and attracted ducks this season.

Breeding Population Indices (Tables B-12 through B-18)

The breeding ground survey for 1979 was conducted in essentially the same manner as in previous years consisting of complete aerial coverage of the "Great Basin" section in northeastern California and aerial transects in the Sacramento Valley, San Joaquin Valley, and Bay Area. On the Klamath Basin National Wildlife Refuge, ground counts were made by refuge personnel and supplemented with aerial survey work.

The survey flights in the Central Valley were conducted on 16 and 17 May, whereas northeastern California was flown from 4 through 8 June. Resulting breeding pair indices indicate an increase in dabblers (+13%), divers (+12%), and total ducks (+12%) compared with 1978. However, Canada geese and coots decreased 7% and 11%, respectively, over the same period.

Colorado

Data supplied by Michael R. Szymczak
Colorado Division of Wildlife

Weather and Habitat Conditions

Water conditions for duck production were good in all areas of the State except the San Luis Valley where the amount of surface water continued to decline. Water in North Park was above average with many basins filled for the first time since 1975. Conditions in the South Platte and Cache la Poudre valleys were best in the western portions of the valleys adjacent to the foothills, and declined eastward. Some artificial marshes in Brown's Park were not optimum for duck production because of a combination of a dry winter and mechanical problems with pumps.

Conditions for Canada goose production were variable throughout the State. In northwest and west-central Colorado, most nests hatched before the high water period, although some flooding was noted, primarily on the Yampa River. In the San Luis Valley, conditions were near normal, and water on the Monte Vista National Wildlife Refuge had improved. In north-central Colorado, reservoirs which had reached a low level in 1977 were near capacity, producing excellent conditions for nesting geese.

Breeding Population and Production (Tables B-19 through B-25)

The total number of duck breeding pairs was down

29% from 1978 levels and 13% below the long-term mean. A decline in the breeding population in the San Luis Valley, which had been expected for a number of years, finally materialized in the 1979 estimate. The large numerical increase in North Park over 1978 levels was not sufficient to offset declines in other areas. The mallard population increased slightly in terms of percent composition but numerically reached a record low level.

Information on the post-nesting season population of Canada geese in northwest Colorado is incomplete; however, total estimated numbers were above 1978 levels and the 1967-78 mean in most areas. Production was below 1978 levels and was expected to be near the 1967-78 mean because of measured or anticipated declines along the Green River.

The aerial breeding pair survey of Canada geese in west central Colorado was conducted on 2 and 4 May 1979, compared with 20 April in 1978 and with 9 May in 1977. The trend in this segment of the nesting population was definitely upward; however, direct year-to-year comparisons were not possible because annual survey dates had not been standardized.

The estimated number of productive breeding pairs of Canada geese in the San Luis Valley was very near the 1977 level.

Results of the 1979 Canada goose production survey in north-central Colorado indicated that the number of adult geese observed in the trend areas was 3% below 1978 and 8% below the 1969-78 mean. However, gosling production increased 45% over 1978 and was 18% above the 1969-78 mean.

Nebraska

Data supplied by John T. Sweet
Nebraska Game and Parks Commission

Weather and Habitat Conditions

Spring temperatures were unseasonably low throughout most of May. Rainfall kept the eastern and western portions of the State in relatively good condition. Although part of the north-central area was dry, most of it, along with the western Sandhills, was snow-covered on 11 May from a late spring storm. The storm contributed to a water index in the Sandhills which was 152% above that of 1978. Despite this increase, total water areas for the State were below 1978.

Breeding Populations (Tables B-26 and B-27)

The 1979 breeding population index for the Sandhills production area was 143,789 birds, an increase of 14% over 1978. Of the 11 identified species, significant changes from 1978 were noted: mallard (+16%), blue-winged teal (+7%), gadwall (+35%), redhead (+101%), canvasback (+304%), and scaup (-72%).

In the Rainwater Basin production area, the breeding

duck index was 14,834, an increase of 6% over 1978. Notable changes by species from 1978 were mallard (+23%), blue-winged teal (+115%), northern shoveler (-61%), and scaup (+14%).

Washington

Data supplied by Richard C. Parker
Washington State Game Department

Weather and Habitat Conditions

Below normal precipitation during the 1978-79 winter, combined with a cooler than normal spring, resulted in a 19% decrease in the number of potholes available during May 1979 compared with May 1978.

Cool spring weather helped to maintain surface water through July 1979 when counts totaled 55 on three transects. Surface water was down 17% from July 1978 and down 27% from the 1969-78 mean. Although the number of potholes counted is down from 1978 and the 10-year mean, surface water was generally adequate for the 1979 waterfowl production year.

Breeding Population and Production (Tables B-28 and B-29)

The number of adult ducks on Washington breeding grounds during 1979 totaled 187,950, which is up 21% from 1978 and up 5% from the 1969-78 mean. Dabbling ducks made up 76% of the production potential, with a total of 143,280, and are up 29% from 1978 and 7% from the 10-year mean.

Mallards responded to available water areas with a total of 67,400. They are up 39% from 1978 and up 22% above the 10-year mean. All other dabblers showed increases over 1978 except pintails, which totaled 5,430. Pintails were down 26% from 1978 and down 28% from the 10-year mean. Adult divers constituted 24% of the duck breeding potential during 1979 with a total of 44,410, up 3% from 1978 and the 10-year mean. Most of this increase was attributable to redheads which totaled 17,880, up 45% from 1978 and up 18% from the 10-year mean. Ruddy ducks also showed an increase to 13,340, up 1% from 1978 and up 7% from the mean. All other divers showed a decrease from 1978 and the mean.

The 1979 total of all ducks, geese, and coots was 689,300, up 70% from 1978 and up 33% from the 10-year mean. Young ducks made up 68% of the index, compared with 54% during 1978 and 58% for the long-term mean. All other dabbling ducks showed production increases over 1978 and the 10-year mean, except pintails which totaled 21,300, up 55% from 1978 but down 7% from the 10-year mean.

The diving duck index was 105,000, up 48% from 1978 and up 24% from the 10-year mean. Redhead production totaled 43,500, up 89% from 1978 and up 40% from the 10-year mean. Scaup and ruddy ducks also showed in-

creases over 1978 and the 10-year mean. Goldeneye production was 6,500, up 63% from 1978 but down 25% from the 10-year mean. All other diving ducks were down from 1978 and the 10-year mean.

The Canada goose production index for 1979 was 12,900, down 8% from 1978 and up 5% from the 10-year mean. Most of the production decrease from 1978 was attributable to a larger-than-average harvest of large Canada geese in eastern Washington during the 1978 hunting season. Counts in the Okanogan and Channeled Scablands do not reflect stocking during 1979, and decreases may be somewhat greater than the total indicates. Other depressing effects on Canada goose production result from application by farmers of heptachlor-treated seed grain on fields and coyote predation on islands in the lower Columbia River when pools are lowered for inspection in late March. Each of these is related to management practices and could be corrected with minor changes.

Wisconsin

Data supplied by Richard Hunt, Bruce Moss,
and Dave Evenson
Wisconsin Department of Natural Resources

Weather and Habitat Conditions (Table B-30)

Waterfowl habitat improved considerably over 1978. Surface water increased 11% and ditches and streams were up 33%. Northern production units include over 1,000 wetlands, and a 10% sample is used to estimate habitat conditions. Total wetland habitat improved 13% over 1978. Of this total, wetland types I and VII (seasonally flooded) showed the greatest increases.

Breeding Populations (Table B-31)

The adjusted population estimates from 1973 to 1979 are shown in Table B-31 for each of the three survey regions. Survey results are separated to identify mallards and blue-winged teal (two of Wisconsin's most abundant locally breeding ducks) as individual species; all other species are combined as one group. It should be emphasized that population data for "other species" are based on extremely small sample sizes and probably do not accurately reflect population trends for all species. For this reason "other species" data must be treated with caution in relation to the statewide survey.

Total breeding ducks in Wisconsin increased 34% from 1978. Mallards increased 20% and blue-winged teal 29%. Total ducks increased 41% in the Southeast-Central region, increased 116% in the Northern Low region, and decreased 24% in the Northern High region. The 116% increase in the Northern Low region is due largely to wood duck (*Aix sponsa*), which increased from 6,600 to 65,600, an increase that reflects more on the inadequacy of this survey to census wood ducks than on an actual increase in wood duck population.

Mallard populations experienced a statewide increase of 20% compared with 1978 and were 12% above the previous 6-year mean; blue-winged teal increased 29% over 1978. They are still 21% below the previous 6-year mean.

Mallards and blue-winged teal increased in the Southeast-Central region and the Northern High region. Both species experienced a significant decrease in the Northern Low region.

Waterfowl Harvest Surveys

Data supplied by Samuel M. Carney, Michael F. Sorensen, and Elwood M. Martin
U.S. Fish and Wildlife Service

This report provides estimates of waterfowl hunting activity and harvests during the 1978 season and compares them with estimates for the 1977 season. Estimates for both years were derived from information obtained from three sources: (1) the Postal Service's report of Migratory Bird Hunting and Conservation Stamp (duck stamp) sales, (2) the U.S. Fish and Wildlife Service's Questionnaire Survey of Waterfowl Hunters, and (3) the Service's Waterfowl Parts Collection Survey.

In previous waterfowl status reports, harvest estimates for a particular State related to hunting by individuals who had purchased duck stamps in that State. No allowance could be made for the fact that some of this harvest may not have occurred in the State. Improved computer-analysis procedures now permit us to assign harvest to the States actually hunted. This change did not affect the estimated size of the U.S. harvest, but it did increase or decrease State estimates depending upon movements of stamp buyers across State lines (Table C-1). Because State estimates changed and species composition varied among States, flyway and U.S. species composition also changed slightly.

Another change initiated with this report affects estimated species compositions of duck harvests within States. Previously, weights (ducks killed per wing received) were calculated by using State-harvest estimates. The new method uses stamp sales zones (subdivisions of States along county lines), and wings received from in-zone stamp buyers are weighted by using zone-harvest estimates.

Procedures

Survey Sampling

The Waterfowl Hunter Questionnaire Survey is designed to obtain answers from representative samples of the Nation's waterfowl hunters that can be expanded to provide estimates of State, flyway, and national totals. Because no list of waterfowl hunters exists, we obtain samples indirectly by randomly selecting more than 3,000 of

the 16,000 post offices that sell duck stamps. Historical sales information is used to select post offices within each stamp sales zone from among three strata (<100, 100-999, or >999 duck stamps sold annually). We usually subsample post offices in large cities by branches or stations. Within States, post offices are selected so that distribution of the samples among zones and strata will be similar to that of duck stamp sales. Each post office selected is sent a supply of postage-paid postcards exceeding anticipated duck stamp sales. Stamp buyers use these cards to record their name, address, and whether their purchase was for hunting or stamp collecting. The last allows us to remove estimated portions of philatelic sales from total duck-stamp sales. A diary portion of the cards may be detached and used to record hunting activity. The approximately 100,000 potential hunters who return a card are sent a questionnaire at the close of the hunting season. We send non-respondents one follow-up questionnaire. About 70,000 contacts return a questionnaire.

The Waterfowl Parts Collection Survey is designed to obtain from waterfowl hunters a representative sample of the waterfowl they shoot from which information can be expanded to State, flyway, and national estimates. Annually we contact about 30,000 hunters selected from successful respondents to the previous year's Questionnaire Survey and Parts Collection Survey; usually about 80% are Questionnaire Survey respondents. Within States, the distribution of these contacts among stamp sales zones is proportional to the previous year's stamp sales. Before the season starts, we send these contacts a supply of postage-paid envelopes with instructions asking them to send one wing from each duck or coot and the tail feathers from each goose they shoot throughout the season and to record the place and time of kill. We include postcards for the hunters to order additional envelopes. About 80,000 parts are received and examined to determine species, sex, and age (immature or adult) for ducks. Only species and age are determined for geese and only species for coots.

Survey Estimates

In determining zone-level means, all questionnaires returned by in-zone stamp buyers, including originals, follow-ups, and those from different stamp sales volume strata, are considered equally. Zone-level means are calculated for retrieved and unretrieved ducks, sea ducks, teal season ducks, geese, and coots as well as for total days hunted. Teal season means for individual States are adjusted downward 9 to 64% based on information from past comparisons of questionnaires sent to all potential hunters; questionnaires are sent only to potential teal season hunters. Each zone mean (including the reduced teal mean) is then multiplied by the number of duck stamps sold in the zone and this, in turn, is multiplied by a State-level estimate of the proportion sold for hunting. Products (zone means \times potential hunters) are rough estimates of totals achieved by all potential hunters who bought duck

stamps in the zone.

Processing of zone totals differs for various harvest parameters because there are differences in the amount and type of information available. Readers interested in processing details may wish to refer to Table C-2. In most instances we make three adjustments to rough zone totals: (1) fixed reduction factors for each flyway to correct for response bias (Table C-3), (2) fixed expansion factors for each flyway to account for activity by hunters less than 16 years old who are not required to buy a duck stamp (Table C-4), and (3) a single reduction factor (0.9637) to retain comparability after 1969 when a change in questionnaire design caused a change in response. The adjustments for response bias are based on procedures developed by E. L. Atwood (1956, Validity of mail survey data on bagged waterfowl. *J. Wildl. Manage.* 20(1):1-16). Junior hunter adjustment factors are based on sampling of hunters less than 16 years old during early years of the survey. Application of these three adjustments produces the totals estimated to have been obtained by all hunters from a given zone.

The duck kill associated with each zone is distributed among species and among States by dividing it by the number of duck wings, regardless of species, taken by in-zone duck stamp buyers. The resulting value (weight), ducks harvested per wing returned, is inserted into each wing record. Once wing records are weighted, they are sorted to the State where the bird was shot, and the weights are summed to provide harvest estimates by State of kill.

Because hunters return much smaller numbers of goose tails than of duck wings, zone harvest estimates are combined to a State-of-purchase estimate and then divided by all the tails received from hunters who purchased duck stamps in the State. Once records have been weighted, State goose harvest estimates are derived in the same manner as for ducks.

In seven Atlantic Flyway States, sea duck wings are separated from other ducks and weighted according to the method for geese. In other States, sea ducks and other ducks are combined in all calculations.

Questionnaires sent to hunters in those States that have September teal seasons request both harvest during all waterfowl seasons and harvest during September teal seasons. Teal harvest by persons who bought duck stamps in the Pacific Flyway areas of Colorado and New Mexico is shifted to the Central Flyway parts of these States. Because questions relating to the teal season are not asked of hunters who bought duck stamps in States where this season is not in effect, in weighting, teal season harvest by State of purchase is divided by the number of wings from ducks shot during the teal season in the State, regardless of where the hunter purchased his duck stamp. The resulting values are considered to be the ducks harvested in the State per wing received and their sum to be the teal season duck harvest for the State.

Although coot wings are solicited from hunters, so few

are received that they are not used in this analysis. Thus, coot harvest estimates relate only to State of stamp purchase.

We have no method for assigning other harvest parameters to the States where hunting actually took place. Thus, all seasonal means, as well as State totals for numbers of hunters, days hunted, and unretrieved kill relate to State of duck stamp purchase.

Administrative Reports

Data in this report are based on final duck stamp sales information. In the Administrative Report "Waterfowl Harvest and Hunter Activity in the United States During the 1978 Hunting Season" (21 June 1979), preliminary estimates (that were based on duck stamp sales through the third quarter of the July 1978-June 1979 duck stamp sales year and made by using the old estimating procedures) were made available for the annual waterfowl regulations meetings in early August 1979. Age and sex compositions are presented in the Administrative Report, "Age and Sex Composition of Ducks and Geese Harvested in the 1978 Hunting Season in Comparison with Prior Years" (22 June 1979).

Results

Estimates of flyway and U.S.-level harvests of ducks (by species), coots, and unretrieved kill are presented in Table C-5. Similar estimates of geese are in Table C-6. Detailed State-level estimates of the duck, goose, and coot harvest, duck stamp sales, and hunter activity and success may be found in Tables C-7 through C-11. These estimates include hunter activity and harvest during regular and special seasons combined. The harvest and species composition during the September teal season is also shown separately in Table C-12.

The following is a resume of 1978 hunter activity and harvest by flyway showing degree of change from 1977 and, for the most commonly harvested duck species, the percentage each comprised of the 1978 duck harvest.

Atlantic Flyway

Duck stamp sales totaled 451,300 (+4%), and 1,945,900 ducks (+3%), 78,000 coots (+46%), and 347,600 geese (-29%) were harvested during 2,958,200 hunter-days (+8%). Persons buying duck stamps for hunting averaged 6.55 days afield (+4%) and bagged an average of 4.41 ducks (+1%) and 0.79 goose (-32%) each. The three most commonly harvested duck species were mallards (23%), wood ducks (21%), and black ducks (13%). Estimates for the Atlantic Flyway are given in Table C-7.

Mississippi Flyway

Duck stamp sales totaled 848,900 (-3%), and 6,340,000

ducks (+6%), 406,900 coots (+43%), and 593,200 geese (+18%) were harvested during 6,742,600 hunter-days (+1%). Persons buying duck stamps for hunting averaged 7.62 days afield (+4%) and bagged an average of 7.36 ducks (+10%) and 0.70 goose (+21%) each. The three most commonly harvested duck species were mallards (36%), wood ducks (12%), and green-winged teal (10%). Estimates for the Mississippi Flyway are given in Table C-8.

Central Flyway

Duck stamp sales totaled 430,600 (+2%), and 2,969,200 ducks (+22%), 55,800 coots (+37%), and 434,000 geese (-16%) were harvested during 2,992,700 hunter-days (+3%). Persons buying duck stamps for hunting averaged 6.57 days afield (+1%) and bagged an average of 6.61 ducks (+20%) and 0.99 goose (-17%) each. The three most commonly harvested duck species were mallards (36%), green-winged teal (15%), and gadwall (10%). Estimates for the Central Flyway are recorded in Table C-9.

Pacific Flyway

Duck stamp sales totaled 381,300 (no change), and 3,975,400 ducks (+29%), 100,400 coots (-11%), and 324,500 geese (+3%) were harvested during 2,837,900 hunter-days (+1%). Persons buying duck stamps for hunting averaged 7.14 days afield (+2%), and bagged an

average of 10.31 ducks (+30%) and 0.86 goose (+5%) each. The three most commonly harvested duck species were mallards (32%), pintails (21%), and green-winged teal (18%). Estimates for the Pacific Flyway are given in Table C-10.

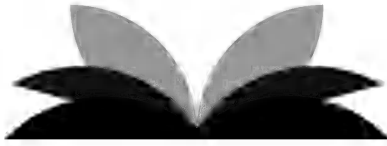
Alaska

Duck stamp sales totaled 19,700 (+2%), and 124,100 ducks (+15%), 600 coots (+31%), and 14,100 geese (-15%) were harvested during 97,800 hunter-days (+14%). Persons buying duck stamps for hunting averaged 4.72 days afield (+13%) and bagged an average of 6.30 ducks (+15%) and 0.73 goose (-16%) each. The three most commonly harvested duck species were mallards (33%), pintails (15%), and green-winged teal (15%). Estimates for Alaska are given in Table C-11.

United States

Duck stamp sales totaled 2,131,800 (no change), and 15,354,500 ducks (+14%), 641,700 coots (+30%), and 1,713,400 geese (-7%) were harvested during 15,629,200 hunter-days (+2%). Persons buying duck stamps for hunting averaged 7.07 days afield (+3%) and bagged an average of 7.11 ducks (+15%) and 0.80 goose (-7%) each. The five most commonly harvested duck species were mallards (33%), green-winged teal (13%), pintails (9%), wood ducks (8%), and American wigeon (7%). Estimates for the United States are given in Table C-11.

BHL



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APPENDIX

Table A-1a. Winter Waterfowl Survey, Pacific Flyway, January 1979.

| Species | 1979 | 1978 | Percent change from 1978 | 1969-78 average | Percent change from 1969-78 average |
|---|-----------|-----------|-----------------------------|--------------------|---|
| Dabblers | | | | | |
| Mallard | 1,216,216 | 1,483,490 | -18 | 1,756,235 | -31 |
| Gadwall | 34,196 | 28,346 | +21 | 26,670 | +28 |
| American wigeon | 753,431 | 954,316 | -21 | 768,046 | - 2 |
| Green-winged teal | 277,506 | 252,721 | +10 | 247,268 | +12 |
| Blue-winged teal | 42 | 0 | + | 62 | -32 |
| Cinnamon teal | 2,589 | 1,620 | +59 | 2,296 | +13 |
| Northern shoveler | 560,110 | 627,998 | -11 | 563,944 | - 1 |
| Pintail | 3,265,814 | 2,997,128 | + 9 | 3,045,162 | + 7 |
| Wood duck | 1,601 | 6,286 | -75 | 4,679 | -66 |
| Subtotal | 6,111,505 | 6,351,905 | - 4 | 6,414,362 | - 5 |
| Divers | | | | | |
| Redhead | 16,049 | 14,728 | + 9 | 13,383 | +20 |
| Canvasback | 80,263 | 78,313 | + 2 | 68,713 | +17 |
| Scaup | 111,658 | 184,713 | -40 | 101,598 | +10 |
| Ring-necked duck | 4,822 | 6,749 | -29 | 4,586 | + 5 |
| Goldeneye | 33,967 | 36,718 | - 7 | 41,955 | -19 |
| Bufflehead | 37,902 | 36,080 | + 5 | 32,720 | +16 |
| Ruddy duck | 74,132 | 70,648 | + 5 | 100,144 | -26 |
| Subtotal | 358,793 | 427,949 | -16 | 363,099 | - 1 |
| Miscellaneous | | | | | |
| Scoter | 110,313 | 105,877 | + 4 | 96,630 | +14 |
| Oldsquaw/harlequin | 394 | 420 | - 6 | 565 | -30 |
| Merganser | 19,903 | 34,666 | -42 | 25,821 | -23 |
| Subtotal | 130,610 | 140,963 | - 7 | 123,016 | + 6 |
| Unidentified | 20,521 | 27,923 | -26 | 35,878 | -43 |
| Total ducks | 6,621,429 | 6,948,815 | - 5 | 6,936,529 | - 5 |
| Geese | | | | | |
| Blue, snow, and Ross' goose | 246,726 | 236,081 | + 4 | 430,172 | -43 |
| White-fronted goose | 37,013 | 112,522 | -67 | 97,933 | -62 |
| Canada goose and lesser Canada goose | 228,803 | 270,630 | -15 | 220,978 | + 3 |
| Cackling goose | 27,668 | 39,411 | -30 | 74,478 | -63 |
| Total geese | 539,760 | 658,644 | -18 | 823,561 | -34 |
| Brant | | | | | |
| Black brant | 9,343 | 19,770 | -53 | 10,788 | -13 |
| Swans | | | | | |
| Whistling swan | 53,523 | 45,597 | +17 | 58,984 | - 9 |
| Trumpeter swan | 1,282 | 1,282 | NC | 1,056 | +21 |
| Total swans | 54,805 | 46,879 | +17 | 60,040 | - 9 |
| Coots | | | | | |
| American coot | 373,224 | 286,117 | +30 | 481,337 | -22 |
| Grand total | 7,598,561 | 7,960,225 | - 5 | 8,312,255 | - 9 |

Table A-1b. Winter Waterfowl Survey, Central Flyway, January 1979.

| Species | 1979 | 1978 | Percent change from 1978 | Average ^a | Percent change from average |
|--------------------------|-----------|-----------|-----------------------------|----------------------|-----------------------------------|
| Dabblers | | | | | |
| Mallard | 1,575,000 | 2,212,000 | -29 | 2,204,000 | -29 |
| Black duck | 6 | 9 | -33 | 50 | -88 |
| Mexican-like | 127 | 270 | -53 | 50 | +154 |
| Mottled duck | 31,400 | 38,700 | -19 | 40,800 | -23 |
| Gadwall | 168,000 | 101,000 | +66 | 191,000 | -12 |
| American wigeon | 82,000 | 121,000 | -32 | 194,000 | -58 |
| Green-winged teal | 1,201,000 | 479,000 | +151 | 439,000 | +174 |
| Blue-winged teal | 1,600 | 2,500 | -36 | 19,800 | -92 |
| Cinnamon teal | | | | 70 | - |
| Northern shoveler | 55,000 | 67,000 | -18 | 79,000 | -30 |
| Pintail | 1,709,000 | 542,000 | +215 | 1,018,000 | +68 |
| Subtotal | 4,825,000 | 3,565,000 | +35 | 4,186,000 | +15 |
| Divers | | | | | |
| Redhead | 155,000 | 257,000 | -40 | 295,000 | -47 |
| Canvasback | 50,000 | 37,000 | +35 | 15,000 | +233 |
| Scaup | 29,000 | 53,000 | -45 | 79,000 | -63 |
| Ring-necked duck | 2,700 | 6,800 | -60 | 6,100 | -56 |
| Goldeneye | 9,100 | 11,000 | -17 | 11,000 | -17 |
| Bufflehead | 8,000 | 5,500 | +45 | 6,200 | +29 |
| Ruddy duck | 6,700 | 5,200 | +29 | 4,600 | +46 |
| Subtotal | 261,000 | 376,000 | -31 | 417,000 | -38 |
| Miscellaneous | | | | | |
| Mergansers | 97,000 | 129,000 | -25 | 73,000 | +33 |
| Unidentified | 18,300 | 19,500 | -6 | 36,000 | -49 |
| Total ducks | 5,201,000 | 4,089,000 | +27 | 4,712,000 | +10 |
| Geese^b | | | | | |
| Blue and snow goose | 801,000 | 1,205,000 | -34 | 762,000 | +5 |
| Ross' goose | | | | 9 | - |
| White-fronted goose | 69,000 | 141,000 | -51 | 57,000 | +21 |
| Canada goose | 483,000 | 583,000 | -17 | 476,000 | +1 |
| Total geese | 1,353,000 | 1,928,000 | -30 | 1,295,000 | +4 |
| Swans | | | | | |
| Whistling swan | 13 | 11 | +18 | | |
| Trumpeter swan | 114 | 174 | -35 | | |
| Total swans | 127 | 185 | -31 | | |
| Coots | | | | | |
| American coot | 265,000 | 196,800 | +35 | | |
| Grand total | 6,819,000 | 6,162,000 | +11 | | |

^aAverages for ducks are for the 1968-77 period and the 1972-76 period for geese.

^bEstimates of geese are from mid-December surveys.

Table A-1c. Winter Waterfowl Survey, Mississippi Flyway, January 1979^a.

| Species | 1979 | 1978 | Percent change from 1978 | 1969-78 average | Percent change from 1969-78 average |
|--------------------------|-----------|-----------|-----------------------------|--------------------|---|
| Dabblers | | | | | |
| Mallard | 3,072,800 | 2,604,900 | +18 | 3,019,400 | + 2 |
| Black duck | 78,500 | 91,400 | -14 | 123,100 | -36 |
| Mottled duck | 44,000 | 33,000 | +33 | 56,900 | -23 |
| Gadwall | 505,300 | 418,300 | +21 | 901,600 | -44 |
| American wigeon | 137,200 | 126,700 | + 8 | 351,400 | -61 |
| Green-winged teal | 446,100 | 398,500 | +12 | 831,400 | -46 |
| Blue-winged teal | 33,000 | 14,700 | +124 | 131,700 | -75 |
| Northern shoveler | 42,900 | 118,200 | -64 | 205,200 | -79 |
| Pintail | 791,900 | 491,400 | +61 | 582,000 | +36 |
| Subtotal | 5,151,700 | 4,297,100 | +20 | 6,202,500 | -17 |
| Divers | | | | | |
| Redhead | 6,200 | 16,100 | -61 | 21,300 | -71 |
| Canvasback | 91,100 | 38,800 | +135 | 44,600 | +104 |
| Scaup | 947,000 | 169,000 | +460 | 777,200 | +22 |
| Ring-necked duck | 77,000 | 60,700 | +27 | 95,000 | -19 |
| Goldeneye | 52,700 | 54,600 | - 3 | 32,900 | +60 |
| Bufflehead | 2,000 | 5,500 | -64 | 3,400 | -41 |
| Ruddy duck | 4,800 | 6,600 | -27 | 18,500 | -74 |
| Subtotal | 1,180,800 | 351,300 | +236 | 992,800 | +19 |
| Miscellaneous | | | | | |
| Scoter and eider | | | | | |
| Oldsquaw | 2,100 | 3,200 | -34 | | |
| Merganser | 36,600 | 29,900 | +22 | | |
| Subtotal | 38,700 | 33,100 | +17 | | |
| Unidentified | 64,700 | 38,100 | +70 | 52,500 | +23 |
| Total ducks | 6,435,900 | 4,719,600 | +36 | 7,247,700 | -11 |
| Geese^b | | | | | |
| Blue and snow goose | 513,000 | 794,100 | -35 | 585,100 | -12 |
| White-fronted goose | 49,300 | 53,100 | - 7 | 44,000 | +12 |
| Canada goose | 844,100 | 1,067,100 | -21 | 686,600 | +23 |
| Total geese | 1,406,400 | 1,914,300 | -27 | 1,315,700 | + 7 ^c |
| Coots | | | | | |
| American coot | 463,500 | 897,200 | -48 | 1,059,900 | -56 |
| Grand total | 8,305,800 | 7,531,100 | +10 | 9,625,400 | -14 |

^aSurvey conducted late in Louisiana and not completed in portions of Louisiana and Mississippi.

^bFigures are from mid-December goose survey.

^cThe current year's goose figures and those of the 10-year average are not strictly comparable because the 10-year average is made up of both January (pre-1970) and December (post-1970) figures.

Table A-1d. Winter Waterfowl Survey, Atlantic Flyway, January 1979.

| Species | 1979 | 1978 | Percent change from 1978 | 1969-78 average | Percent change from 1969-78 average |
|----------------------|-----------|-----------|-----------------------------|--------------------|---|
| Dabblers | | | | | |
| Mallard | 264,210 | 267,568 | - 1 | 211,453 | +25 |
| Black duck | 236,268 | 269,535 | -12 | 271,241 | -13 |
| Mottled duck | 500 | 100 | +400 | 408 | +23 |
| Gadwall | 31,749 | 21,544 | +47 | 20,063 | +58 |
| American wigeon | 48,820 | 69,686 | -30 | 73,797 | -34 |
| Green-winged teal | 49,688 | 40,098 | +24 | 62,721 | -21 |
| Blue-winged teal | 15,000 | 19,404 | -23 | 10,750 | +40 |
| Northern shoveler | 11,132 | 5,037 | +121 | 12,855 | -13 |
| Pintail | 72,071 | 89,607 | -20 | 102,525 | -30 |
| Tree duck | 400 | | + | 70 | +329 |
| Subtotal | 729,838 | 778,579 | - 6 | 765,346 | - 5 |
| Divers | | | | | |
| Redhead | 93,646 | 147,649 | -37 | 114,430 | -18 |
| Canvasback | 143,305 | 117,011 | +23 | 115,329 | +24 |
| Scaup | 388,800 | 314,135 | +24 | 480,132 | -19 |
| Ring-necked duck | 33,109 | 31,182 | + 6 | 61,207 | -47 |
| Goldeneye | 37,183 | 40,466 | - 8 | 50,896 | -27 |
| Bufflehead | 57,166 | 71,924 | -21 | 53,674 | + 7 |
| Ruddy duck | 139,125 | 45,537 | +200 | 50,123 | +178 |
| Subtotal | 892,334 | 767,904 | +16 | 925,793 | - 4 |
| Miscellaneous | | | | | |
| Eider | 115,996 | 84,351 | +36 | 67,561 | +72 |
| Scoter | 49,574 | 58,616 | -15 | 86,561 | -43 |
| Oldsquaw | 18,249 | 18,268 | NC | 13,489 | +35 |
| Merganser | 46,621 | 64,059 | -27 | 45,741 | + 2 |
| Subtotal | 230,440 | 225,294 | + 2 | 213,352 | + 8 |
| Unidentified | 30,302 | 9,561 | +300 | 27,813 | + 9 |
| Total ducks | 1,882,914 | 1,781,338 | + 6 | 1,938,114 | - 3 |
| Geese | | | | | |
| Snow goose | 99,920 | 73,703 | +36 | 76,618 | +30 |
| Blue goose | 1,793 | 1,458 | +23 | 1,839 | - 3 |
| Canada goose | 823,605 | 833,232 | - 1 | 766,202 | + 8 |
| Total geese | 925,318 | 908,393 | + 2 | 844,659 | +10 |
| Brant | | | | | |
| Atlantic brant | 43,554 | 46,340 | - 6 | 92,701 | -53 |
| Swans | | | | | |
| Whistling swan | 78,558 | 70,248 | +12 | 65,093 | +21 |
| Mute swan | 2,102 | 2,142 | - 2 | 1,970 | + 7 |
| Total swans | 80,660 | 72,390 | +11 | 67,063 | +20 |
| Coots | 319,569 | 296,641 | + 8 | 348,851 | - 8 |
| Grand total | 3,252,015 | 3,105,102 | + 5 | 3,289,334 | - 1 |

Table A-2. Winter Survey, January 1979--Waterfowl by State and Flyway.

| State | Ducks | Geese | Brant | Swans | Coots | Total |
|--------------------------|-----------|-----------|-----------|-----------------|-----------|-----------|
| Pacific Flyway | | | | | | |
| Washington | 574,449 | 54,833 | 8,078 | 1,771 | 12,858 | 651,989 |
| Oregon | 334,580 | 107,031 | 1,255 | 3,962 | 14,181 | 461,009 |
| Idaho | 832,406 | 35,625 | | 808 | 16,922 | 435,761 |
| Nevada | 18,550 | 5,735 | | 234 | 8,490 | 33,009 |
| California | 5,207,280 | 323,985 | 10 | 47,730 | 317,385 | 5,896,390 |
| Utah | 37,580 | 3,752 | | 33 | 208 | 41,573 |
| Arizona ^a | 18,546 | 1,752 | | | 3,160 | 23,458 |
| Montana ^a | 25,576 | 374 | | 267 | 20 | 26,237 |
| Wyoming ^a | No survey | No survey | No survey | No survey | No survey | No survey |
| Colorado ^a | 13,275 | 2,979 | | | | 16,254 |
| New Mexico ^a | 8,887 | 3,694 | | | | 12,581 |
| Flyway total | 6,621,429 | 539,760 | 9,343 | 54,805 | 373,224 | 7,598,561 |
| Central Flyway | | | | | | |
| Montana ^b | 31,000 | 1,300 | | | | 32,300 |
| Wyoming ^b | 24,000 | 5,800 | | | | 29,800 |
| North Dakota | 1,700 | 1,100 | | | | 2,800 |
| South Dakota | 146,000 | 78,000 | | 114 | | 224,000 |
| Nebraska ^b | 250,000 | 12,000 | | | | 262,000 |
| Colorado ^b | 187,000 | 83,000 | | 2 | | 270,000 |
| Kansas | 353,000 | 241,000 | | | | 594,000 |
| Oklahoma | 175,000 | 96,000 | | 9 | | 271,000 |
| New Mexico ^b | 186,000 | 41,000 | | 2 | | 227,000 |
| Texas | 3,845,000 | 793,000 | | | 265,000 | 4,903,000 |
| Flyway total | 5,201,000 | 1,353,000 | | 127 | 265,000 | 6,819,000 |
| Mississippi Flyway | | | | | | |
| Minnesota | 26,900 | 30,200 | | TR ^e | TR | 57,100 |
| Wisconsin | 20,700 | 2,200 | | | | 22,900 |
| Michigan | 22,500 | 24,500 | | TR | | 47,000 |
| Iowa | 26,800 | 71,900 | | | | 98,700 |
| Missouri | 157,000 | 277,900 | | TR | 4,800 | 439,700 |
| Illinois | 242,500 | 368,900 | | TR | 100 | 611,500 |
| Indiana | 60,000 | 28,200 | | | 200 | 88,400 |
| Ohio | 32,500 | 24,200 | | TR | 200 | 56,900 |
| Arkansas | 626,100 | 9,100 | | | 3,400 | 638,600 |
| Mississippi ^c | 251,800 | 3,400 | | | 10,200 | 265,400 |
| Louisiana ^{c,d} | 4,451,200 | 403,200 | | TR | 406,800 | 5,261,200 |
| Alabama | 93,800 | 27,900 | | TR | 25,200 | 146,900 |
| Kentucky | 49,600 | 48,100 | | TR | 100 | 97,800 |
| Tennessee | 374,500 | 86,700 | | TR | 12,500 | 473,700 |
| Flyway total | 6,435,900 | 1,406,400 | | TR | 463,500 | 8,305,800 |

| State | Ducks | Geese | Brant | Swans | Coots | Total |
|-----------------|-----------|---------|--------|--------|---------|-----------|
| Atlantic Flyway | | | | | | |
| Maine | 59,398 | 710 | 100 | | | 60,108 |
| New Hampshire | 597 | 840 | | | | 1,797 |
| Vermont | 3,144 | 583 | | | | 3,727 |
| Massachusetts | 151,760 | 16,192 | 760 | 427 | | 169,139 |
| Connecticut | 33,030 | 5,417 | | 597 | | 39,044 |
| Rhode Island | 22,688 | 1,291 | 8 | 81 | | 24,068 |
| New York | 87,165 | 14,085 | 8,211 | 582 | 238 | 110,281 |
| New Jersey | 254,910 | 30,170 | 31,890 | 3,468 | 220 | 320,658 |
| Pennsylvania | 27,491 | 27,573 | | 600 | 62 | 55,726 |
| Delaware | 41,048 | 48,729 | 885 | 101 | | 90,763 |
| Maryland | 240,800 | 594,200 | | 34,521 | 3,700 | 873,221 |
| Virginia | 121,428 | 98,548 | 1,700 | 9,683 | 2,449 | 233,808 |
| West Virginia | 1,895 | 580 | | | | 2,475 |
| North Carolina | 425,600 | 77,000 | | 30,500 | 31,800 | 564,900 |
| South Carolina | 237,800 | 7,100 | | 100 | 116,500 | 361,500 |
| Georgia | 27,200 | 900 | | | 14,000 | 42,100 |
| Florida | 146,500 | 1,400 | | | 150,600 | 298,500 |
| Flyway total | 1,882,914 | 925,318 | 43,554 | 80,660 | 319,569 | 3,252,015 |

^aPacific Flyway portion only.

^bCentral Flyway portion only.

^cSurvey not complete in portions of State.

^dSurvey conducted late (16-22 January).

^eTR=TRace; fewer than 50 birds.

Table A-3. Winter Waterfowl Survey of Mexico, January 1979.

| Species | East Coast | | | Interior Highlands | | | West Coast | | | Total Mexico | | |
|--------------------------------------|------------|-----------|--------------------------|--------------------|---------|--------------------------|------------|-----------|--------------------------|--------------|-----------|--------------------------|
| | 1979 | 1978 | Percent change from 1978 | 1979 | 1978 | Percent change from 1978 | 1979 | 1978 | Percent change from 1978 | 1979 | 1978 | Percent change from 1978 |
| Dabblers | | | | | | | | | | | | |
| Mallard | 90 | 5 | + | 10,480 | 3,530 | +197 | 35 | | + | 10,605 | 3,535 | +200 |
| Mexican duck | | | | 14,215 | 22,470 | - 36 | | 10 | - | 14,215 | 22,480 | - 37 |
| Mottled duck | 2,200 | 3,510 | - 37 | | | | | | | 2,200 | 3,510 | - 37 |
| Gadwall | 46,035 | 30,500 | + 51 | 12,875 | 28,000 | - 54 | 10,315 | 21,781 | - 53 | 69,225 | 80,281 | - 14 |
| American wigeon | 98,290 | 119,625 | - 18 | 23,000 | 62,385 | - 63 | 106,290 | 96,285 | + 10 | 227,580 | 278,295 | - 18 |
| Green-winged teal | 33,815 | 11,600 | +192 | 90,485 | 173,345 | - 52 | 220,300 | 207,215 | - 6 | 344,600 | 392,160 | - 12 |
| Blue-winged teal and cinnamon teal | 583,610 | 288,145 | +102 | 33,635 | 32,200 | + 4 | 177,745 | 312,965 | - 43 | 794,990 | 633,310 | + 26 |
| Northern shoveler | 74,940 | 58,520 | + 28 | 60,620 | 102,500 | - 41 | 126,380 | 192,122 | - 34 | 261,940 | 353,142 | - 26 |
| Pintail | 219,160 | 150,385 | + 46 | 151,890 | 168,215 | - 10 | 756,385 | 896,650 | - 16 | 1,127,435 | 1,215,250 | - 7 |
| Fulvous tree duck ^a | 81,505 | 35,725 | +128 | | 75 | - | 11,860 | 21,720 | - 45 | 114,655 | 68,505 | + 67 |
| Black-bellied tree duck ^a | | | | 15 | 700 | - 98 | | | +107 | | | |
| Subtotal | 1,139,645 | 698,015 | + 63 | 397,215 | 593,420 | - 33 | 1,430,585 | 1,759,033 | - 19 | 2,967,445 | 3,050,468 | - 3 |
| Divers | | | | | | | | | | | | |
| Redhead | 198,945 | 268,550 | - 26 | 9,235 | 690 | + | 19,670 | 22,411 | - 12 | 227,850 | 291,651 | - 22 |
| Canvasback | 11,275 | 9,405 | + 20 | 1,570 | 7,250 | - 78 | 40 | 1,382 | - 97 | 12,885 | 18,037 | - 29 |
| Scaup | 147,495 | 226,215 | - 35 | 2,750 | 9,195 | - 70 | 79,825 | 99,451 | - 20 | 230,070 | 334,861 | - 31 |
| Ringneck | 18,915 | 22,215 | - 15 | 350 | 15,865 | - 98 | 100 | 1,072 | - 91 | 19,365 | 39,152 | - 50 |
| Goldeneye | | | | | | | 20 | 816 | - 98 | 20 | 816 | - 98 |
| Bufflehead | 265 | 190 | + 40 | 235 | 75 | +213 | 2,370 | 2,097 | + 13 | 2,870 | 2,362 | + 22 |
| Ruddy duck | 10,925 | 17,615 | - 38 | 320 | 150 | +113 | 3,940 | 9,875 | - 60 | 15,185 | 27,640 | - 45 |
| Subtotal | 387,820 | 544,190 | - 29 | 14,460 | 33,225 | - 56 | 105,965 | 137,104 | - 23 | 508,245 | 714,519 | - 29 |
| Miscellaneous | | | | | | | | | | | | |
| Scoters | | | | | | | 18,780 | 7,486 | +151 | 18,780 | 7,486 | +151 |
| Mergansers | 1,025 | 940 | + 9 | 190 | 220 | - 14 | 5,960 | 7,010 | - 15 | 7,175 | 8,170 | - 12 |
| Other | | | | | 10,660 | - | | 6,750 | - | | 17,410 | - |
| Subtotal | 1,025 | 940 | + 9 | 190 | 10,880 | - 98 | 24,740 | 21,246 | + 16 | 25,955 | 33,066 | - 22 |
| Total ducks | 1,528,490 | 1,243,145 | + 23 | 411,865 | 637,525 | - 35 | 1,561,290 | 1,917,383 | - 19 | 3,501,645 | 3,798,053 | - 8 |
| Geese | | | | | | | | | | | | |
| Canada | 3,035 | 4,200 | - 28 | 190 | | + | 30 | | + | 3,255 | 4,200 | - 22 |
| Brant | | | | | | | 120,070 | 143,117 | - 16 | 120,070 | 143,117 | - 16 |
| White-fronted | 33,165 | 9,550 | +247 | 26,545 | 34,450 | - 23 | 3,790 | 2,137 | + 77 | 63,500 | 46,137 | + 38 |
| Snow/blue | 17,480 | 25,615 | - 32 | 60,770 | 56,795 | + 7 | 725 | 600 | + 21 | 78,975 | 83,010 | - 5 |
| Total geese | 53,680 | 39,365 | + 36 | 87,505 | 91,245 | - 4 | 124,615 | 145,854 | - 15 | 265,800 | 276,464 | - 4 |
| Coot | 814,695 | 629,840 | + 29 | 91,075 | 74,835 | + 22 | 160,040 | 151,315 | + 6 | 1,065,810 | 855,990 | + 24 |

^aTree ducks combined on East Coast and on Total Mexico.

APPENDIX B. WATERFOWL BREEDING GROUND SURVEY TABLES.

TABLE B-1. ALASKA--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|
| | 1979 ^{a/} | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE |
| MAY PONDS | NOT APPLICABLE | | | | JULY PONDS | NOT APPLICABLE | | |
| | | | | | DUCK BROOD INDEX | NOT APPLICABLE | | |
| | | | | | AVG. BROOD SIZE | NOT APPLICABLE | | |
| | BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | |
| DUCKS: | | | | | NOT APPLICABLE | | | |
| DABBLERS: | | | | | | | | |
| MALLARD | 234.5 | -13 | 211.9 | +11 | | | | |
| BLACK DUCK | 0.0 | N.C. | 0.0 | N.C. | | | | |
| GADWALL | 1.2 | -64 | 1.6 | -25 | | | | |
| AMERICAN WIGEON | 755.9 | -15 | 530.0 | +43 | | | | |
| GREEN-WINGED TEAL | 277.9 | -8 | 261.2 | +6 | | | | |
| BLUE-WINGED TEAL | 0.0 | -100 | 1.8 | -100 | | | | |
| NORTHERN SHOVELER | 119.0 | -50 | 109.5 | +9 | | | | |
| PINTAIL | 1,020.8 | -26 | 1,263.0 | -19 | | | | |
| SUBTOTAL | 2,409.3 | -22 | 2,379.0 | +1 | | | | |
| DIVERS: | | | | | | | | |
| REDHEAD | 1.5 | +1400 | 1.8 | -17 | | | | |
| CANVASBACK | 61.4 | +28 | 74.9 | -18 | | | | |
| SCAUP | 1,203.2 | -9 | 1,264.3 | -5 | | | | |
| RING-NECKED | .6 | | 0.0 | | | | | |
| AMERICAN GOLDENEYE | 158.5 | +52 | 130.6 | +21 | | | | |
| BUFFLEHEAD | 113.7 | +13 | 73.8 | +54 | | | | |
| SUBTOTAL | 1,539.2 | -2 | 1,545.4 | N.C. | | | | |
| MISCELLANEOUS: | | | | | | | | |
| OLDSQUAW | 677.2 | -25 | 623.2 | +9 | | | | |
| EIDER | 23.6 | +72 | 23.9 | -1 | | | | |
| SCOTER | 472.6 | +2 | 381.0 | +24 | | | | |
| RUDDY DUCK | 0.0 | N.C. | 0.0 | N.C. | | | | |
| MERGANSER | 8.2 | -53 | 6.7 | +22 | | | | |
| SUBTOTAL | 1,181.6 | -16 | 1,034.8 | +14 | | | | |
| TOTAL DUCKS | 5,130.1 | -16 | 4,959.2 | +3 | | | | |
| COOTS | | | | | | | | |
| AMERICAN COOT | 0.0 | N.C. | 0.0 | N.C. | | | | |
| GRAND TOTAL | 5,130.1 | -16 | 4,959.2 | +3 | | | | |

^{a/}Averages added in for Stratum 7 which is no longer surveyed.

TABLE B-2. NORTHERN ALBERTA AND THE NORTHWEST TERRITORIES--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE |
| MAY PONDS | NOT APPLICABLE | | | | JULY PONDS | NOT APPLICABLE | | |
| | | | | | DUCK BROOD INDEX | NOT APPLICABLE | | |
| | | | | | AVG. BROOD SIZE | NOT APPLICABLE | | |
| | BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | |
| DUCKS: | | | | | NOT APPLICABLE | | | |
| DABLERS: | | | | | | | | |
| MALLARD | 1,261.2 | +14 | 1,136.8 | +11 | | | | |
| BLACK DUCK | 0.0 | N.C. | 0.1 | -100 | | | | |
| GADWALL | 63.9 | +76 | 29.3 | +118 | | | | |
| AMERICAN WIGEON | 688.4 | -26 | 755.7 | -9 | | | | |
| GREEN-WINGED TEAL | 916.6 | -5 | 652.4 | +40 | | | | |
| BLUE-WINGED TEAL | 291.9 | -26 | 231.1 | +26 | | | | |
| NORTHERN SHOVELER | 123.7 | +24 | 170.8 | -28 | | | | |
| PINTAIL | 358.0 | -6 | 473.2 | -24 | | | | |
| SUBTOTAL | 3,703.7 | -5 | 3,449.4 | +7 | | | | |
| DIVERS: | | | | | | | | |
| REDHEAD | 44.8 | -45 | 35.2 | +27 | | | | |
| CANVASBACK | 48.2 | +54 | 46.6 | +3 | | | | |
| SCAUP | 4,529.7 | +33 | 3,943.5 | +15 | | | | |
| RING-NECKED | 109.3 | -28 | 118.8 | -8 | | | | |
| AMERICAN GOLDENEYE | 308.2 | +36 | 111.6 | +176 | | | | |
| BUFFLEHEAD | 541.2 | -2 | 462.8 | +17 | | | | |
| SUBTOTAL | 5,581.4 | +26 | 4,718.5 | +18 | | | | |
| MISCELLANEOUS: | | | | | | | | |
| OLDSQUAW | 2,044.1 | +248 | 724.1 | +182 | | | | |
| EIDER | 3.3 | | 0.0 | | | | | |
| SCOTER | 1,295.9 | +17 | 864.7 | +50 | | | | |
| RUDDY DUCK | 18.3 | +8 | 35.0 | -48 | | | | |
| MERGANSER | 194.4 | -28 | 96.7 | +101 | | | | |
| SUBTOTAL | 3,556.0 | +79 | 1,720.5 | +107 | | | | |
| TOTAL DUCKS | 12,841.1 | +24 | 9,888.4 | +30 | | | | |
| COOTS | | | | | | | | |
| AMERICAN COOT | 12.2 | -85 | 113.4 | -89 | | | | |
| GRAND TOTAL | 12,853.3 | +23 | 10,001.8 | +29 | | | | |

TABLE B-3. NORTHERN SASKATCHEWAN AND NORTHERN MANITOBA--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE |
| MAY PONDS | NOT APPLICABLE | | | | JULY PONDS | NOT APPLICABLE | | |
| | | | | | DUCK BROOD INDEX | NOT APPLICABLE | | |
| | | | | | AVG. BROOD SIZE | NOT APPLICABLE | | |
| | BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | |
| DUCKS: | | | | | INCOMPLETE SURVEY | | | |
| DABLERS: | | | | | | | | |
| MALLARD | 1,154.2 | -13 | 1,028.3 | +12 | | | | |
| BLACK DUCK | 2.1 | -75 | 4.0 | -48 | | | | |
| GADWALL | 30.1 | -29 | 54.4 | -45 | | | | |
| AMERICAN WIGEON | 278.2 | -24 | 321.2 | -13 | | | | |
| GREEN-WINGED TEAL | 675.5 | -27 | 381.6 | +77 | | | | |
| BLUE-WINGED TEAL | 209.2 | -48 | 311.0 | -33 | | | | |
| NORTHERN SHOVELER | 26.3 | -44 | 50.3 | -48 | | | | |
| PINTAIL | 45.1 | -59 | 95.2 | -53 | | | | |
| SUBTOTAL | 2,420.7 | -25 | 2,246.0 | +8 | | | | |
| DIVERS: | | | | | | | | |
| REDHEAD | 18.7 | -43 | 47.8 | -61 | | | | |
| CANVASBACK | 18.9 | -39 | 39.4 | -52 | | | | |
| SCAUP | 1,292.1 | +52 | 880.2 | +47 | | | | |
| RING-NECKED | 212.9 | -35 | 322.8 | -34 | | | | |
| AMERICAN GOLDENEYE | 133.5 | -28 | 235.6 | -43 | | | | |
| BUFFLEHEAD | 240.6 | -2 | 190.3 | +26 | | | | |
| SUBTOTAL | 1,916.7 | +15 | 1,716.1 | +12 | | | | |
| MISCELLANEOUS: | | | | | | | | |
| OLDSQUAW | 0.0 | N.C. | .6 | -100 | | | | |
| EIDER | 0.0 | N.C. | 0.0 | N.C. | | | | |
| SCOTER | 78.5 | -5 | 68.6 | +14 | | | | |
| RUDDY DUCK | 7.7 | -50 | 14.2 | -46 | | | | |
| MERGANSE | 263.8 | -46 | 272.3 | -3 | | | | |
| SUBTOTAL | 350.0 | -41 | 355.7 | -2 | | | | |
| TOTAL DUCKS | 4,687.4 | -15 | 4,317.8 | +9 | | | | |
| COOTS | | | | | | | | |
| AMERICAN COOT | 30.3 | -64 | 92.4 | -67 | | | | |
| GRAND TOTAL | 4,717.7 | -15 | 4,410.2 | +7 | | | | |

TABLE B-4. SOUTHERN ALBERTA--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|-----|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | |
| MAY PONDS | 591.2 | +19 | 736.2 | -20 | JULY PONDS | 437.8 | +22 | 472.5 | -7 |
| | | | | | DUCK BROOD INDEX | 129.3 | -2 | 111.4 | +16 |
| | | | | | AVG. BROOD SIZE | 5.100 | -7 | 5.362 | -5 |
| | BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | | |
| DUCKS: | | | | | | | | | |
| DABLERS: | | | | | | | | | |
| MALLARD | 983.2 | +19 | 1,424.7 | -31 | 17.4 | -15 | 19.4 | -10 | |
| BLACK DUCK | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| GADWALL | 346.5 | +24 | 359.0 | -3 | 11.8 | +26 | 8.3 | +42 | |
| AMERICAN WIGEON | 402.4 | +33 | 393.6 | +2 | 9.1 | +11 | 6.7 | +36 | |
| GREEN-WINGED TEAL | 256.9 | +16 | 294.2 | -13 | 8.8 | +66 | 8.0 | +10 | |
| BLUE-WINGED TEAL | 592.9 | +51 | 722.8 | -18 | 12.7 | -29 | 11.2 | +13 | |
| NORTHERN SHOVELER | 391.4 | -4 | 419.2 | -7 | 5.1 | -9 | 6.1 | -16 | |
| PINTAIL | 1,456.3 | +34 | 1,362.4 | +7 | 7.2 | -8 | 8.9 | -19 | |
| SUBTOTAL | 4,429.6 | +26 | 4,975.9 | -11 | 72.1 | -3 | 68.6 | +5 | |
| DIVERS: | | | | | | | | | |
| REDHEAD | 100.8 | -25 | 159.3 | -37 | 1.1 | -31 | 1.6 | -31 | |
| CANVASBACK | 53.4 | -39 | 78.7 | -32 | 1.2 | +100 | 1.1 | +9 | |
| SCAUP | 687.5 | +48 | 439.3 | +56 | 35.3 | +36 | 20.5 | +72 | |
| RING-NECKED | 6.8 | -58 | 7.1 | -4 | 0.0 | -100 | .7 | -100 | |
| AMERICAN GOLDENEYE | 8.6 | -77 | 18.8 | -54 | .4 | -20 | .2 | +100 | |
| BUFFLEHEAD | 62.9 | +11 | 40.1 | +57 | .4 | -56 | .3 | +33 | |
| SUBTOTAL | 920.0 | +16 | 743.3 | +24 | 38.4 | +24 | 24.4 | +57 | |
| MISCELLANEOUS: | | | | | | | | | |
| OLDSQUAW | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| EIDER | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| SCOTER | 43.5 | +39 | 19.8 | +120 | 1.6 | +700 | .5 | +220 | |
| RUDDY DUCK | 41.1 | -52 | 79.5 | -48 | 4.8 | +20 | 5.6 | -14 | |
| MERGANSER | 3.6 | -65 | 3.7 | -3 | .2 | | 0.0 | | |
| SUBTOTAL | 88.2 | -31 | 103.0 | -14 | 6.6 | +57 | 6.1 | +8 | |
| TOTAL DUCKS | 5,437.8 | +22 | 5,822.2 | -7 | 117.1 | +7 | 99.1 | +18 | |
| COOTS | | | | | | | | | |
| AMERICAN COOT | 418.0 | +148 | 334.2 | +25 | | | | | |
| GRAND TOTAL | 5,855.8 | +27 | 6,156.4 | -5 | | | | | |

TABLE R-5. SOUTHERN SASKATCHEWAN--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|-----|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | |
| MAY PONDS | 2,952.0 | +42 | 2,161.1 | +37 | JULY PONDS | 1,036.4 | +22 | 1,135.8 | -9 |
| | | | | | DUCK BROOD INDEX | 107.2 | -18 | 149.5 | -28 |
| | | | | | AVG. BROOD SIZE | 5.294 | +12 | 5.042 | +5 |
| | BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | | |
| DUCKS: | | | | | | | | | |
| DABBLERS: | | | | | | | | | |
| MALLARD | 2,237.1 | +17 | 2,584.8 | -13 | 87.3 | +58 | 70.0 | +25 | |
| BLACK DUCK | .7 | | .2 | +250 | 0.0 | N.C. | 0.0 | N.C. | |
| GADWALL | 993.6 | +21 | 614.1 | +62 | 29.8 | -9 | 30.7 | -3 | |
| AMERICAN WIGEON | 812.8 | +27 | 757.1 | +7 | 13.8 | +50 | 14.6 | -5 | |
| GREEN-WINGED TEAL | 463.7 | +53 | 336.5 | +38 | 12.2 | +130 | 9.2 | +33 | |
| BLUE-WINGED TEAL | 1,482.8 | +64 | 1,722.7 | -14 | 34.1 | +101 | 25.5 | +34 | |
| NORTHERN SHOVELER | 692.4 | +62 | 698.3 | -1 | 10.0 | +82 | 12.9 | -22 | |
| PINTAIL | 1,580.0 | +64 | 1,827.2 | -14 | 16.2 | N.C. | 28.8 | -44 | |
| SUBTOTAL | 8,263.1 | +39 | 8,540.9 | -3 | 203.4 | +44 | 191.7 | +6 | |
| DIVERS: | | | | | | | | | |
| REDHEAD | 227.9 | +24 | 214.5 | +6 | 8.9 | +56 | 7.1 | +25 | |
| CANVASBACK | 280.9 | +118 | 216.1 | +30 | 3.2 | +7 | 4.8 | -33 | |
| SCAUP | 796.5 | +51 | 403.3 | +97 | 42.4 | +97 | 17.8 | +138 | |
| RING-NECKED | 54.0 | +4 | 30.8 | +75 | 5.0 | +35 | 2.0 | +150 | |
| AMERICAN GOLDENEYE | 40.2 | +154 | 21.3 | +89 | .9 | +80 | .4 | +125 | |
| BUFFLEHEAD | 61.8 | +6 | 41.0 | +51 | 4.2 | +163 | 2.2 | +91 | |
| SUBTOTAL | 1,461.3 | +51 | 927.0 | +58 | 64.6 | +79 | 34.3 | +88 | |
| MISCELLANEOUS: | | | | | | | | | |
| OLDSQUAW | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| EIDER | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| SCOTER | 15.1 | +372 | 4.1 | +268 | 1.4 | -53 | .8 | +75 | |
| RUDDY DUCK | 134.5 | +98 | 96.9 | +39 | 23.8 | +69 | 17.1 | +39 | |
| MERGANSE | 8.2 | +100 | 2.3 | +257 | 0.0 | -100 | .1 | -100 | |
| SUBTOTAL | 157.8 | +109 | 103.3 | +53 | 25.2 | +43 | 18.0 | +40 | |
| TOTAL DUCKS | 9,882.2 | +41 | 9,571.2 | +3 | 293.2 | +50 | 244.0 | +20 | |
| COOTS | | | | | | | | | |
| AMERICAN COOT | 1,309.1 | +202 | 840.7 | +56 | | | | | |
| GRAND TOTAL | 11,191.3 | +50 | 10,411.9 | +7 | | | | | |

TABLE B-6. SOUTHERN MANITOBA--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|----|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | |
| MAY PONDS | 776.1 | -16 | 708.4 | +10 | JULY PONDS | 328.7 | +6 | 348.1 | -6 |
| | | | | | DUCK BROOD INDEX | 28.4 | -37 | 26.2 | +8 |
| | | | | | AVG. BROOD SIZE | 5.187 | +5 | 5.405 | -4 |
| | | | | | BREEDING POPULATION ESTIMATES | | | | |
| | | | | | LATE-NESTING INDEXES | | | | |
| DUCKS: | | | | | | | | | |
| DABLERS: | | | | | | | | | |
| MALLARD | 356.9 | +24 | 348.3 | +2 | 16.4 | +1 | 13.1 | +25 | |
| BLACK DUCK | 1.8 | +260 | .2 | +800 | 0.0 | N.C. | 0.0 | N.C. | |
| GADWALL | 223.3 | +21 | 77.6 | +188 | 4.5 | +137 | 1.2 | +275 | |
| AMERICAN WIGEON | 71.6 | +15 | 44.2 | +62 | 3.4 | +113 | 1.3 | +162 | |
| GREEN-WINGED TEAL | 104.2 | +14 | 110.2 | -5 | 1.3 | -65 | 1.3 | N.C. | |
| BLUE-WINGED TEAL | 440.7 | +58 | 524.5 | -16 | 7.9 | +5 | 4.7 | +68 | |
| NORTHERN SHOVELER | 85.9 | +32 | 89.4 | -4 | .9 | +50 | .8 | +13 | |
| PINTAIL | 196.0 | +116 | 177.4 | +10 | 1.6 | -41 | 1.6 | N.C. | |
| SUBTOTAL | 1,480.4 | +39 | 1,371.8 | +8 | 36.0 | +5 | 24.0 | +50 | |
| DIVERS: | | | | | | | | | |
| REDHEAD | 80.6 | +165 | 82.6 | -2 | 2.1 | +250 | .8 | +163 | |
| CANVASBACK | 49.3 | +32 | 60.7 | -19 | .8 | +100 | .5 | +60 | |
| SCAUP | 89.6 | -61 | 123.5 | -27 | 5.2 | +21 | 1.9 | +174 | |
| RING-NECKED | 38.7 | +23 | 15.1 | +195 | .7 | +250 | .3 | +133 | |
| AMERICAN GOLDENEYE | 20.9 | -56 | 20.7 | +1 | .5 | | .1 | +400 | |
| BUFFLEHEAD | 11.8 | -65 | 17.6 | -33 | .7 | | .2 | +250 | |
| SUBTOTAL | 290.9 | -29 | 318.2 | -9 | 10.0 | +82 | 3.8 | +163 | |
| MISCELLANEOUS: | | | | | | | | | |
| OLDSQUAW | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| EIDER | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| SCOTER | .5 | -44 | .9 | -44 | 0.0 | N.C. | 0.0 | N.C. | |
| BUDDY DUCK | 43.7 | -56 | 90.5 | -52 | 4.6 | +39 | 4.5 | +2 | |
| MERGANSER | 17.2 | +182 | 4.6 | +274 | 0.0 | N.C. | 0.0 | N.C. | |
| SUBTOTAL | 61.4 | -43 | 96.0 | -36 | 4.6 | +39 | 4.5 | +2 | |
| TOTAL DUCKS | 1,832.7 | +16 | 1,786.0 | +3 | 50.7 | +18 | 32.3 | +57 | |
| COOTS | | | | | | | | | |
| AMERICAN COOT | 182.8 | -35 | 295.7 | -38 | | | | | |
| GRAND TOTAL | 2,015.5 | +8 | 2,081.7 | -3 | | | | | |

TABLE B-8. NORTH DAKOTA--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | | |
|-------------------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|------|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | |
| MAY PONDS | 637.3 | +54 | 570.1 | +12 | JULY PONDS | 317.5 | +38 | 346.2 | -8 |
| | | | | | DUCK BROOD INDEX | 30.7 | -18 | 40.7 | -25 |
| | | | | | AVG. BROOD SIZE | 4.844 | -12 | 5.673 | -15 |
| BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | | | |
| DUCKS: | | | | | | | | | |
| DABBLERS: | | | | | | | | | |
| MALLARD | 684.6 | +35 | 570.5 | +20 | | 2.9 | -53 | 13.5 | -79 |
| BLACK DUCK | 0.0 | N.C. | 0.0 | N.C. | | 0.0 | N.C. | 0.0 | N.C. |
| CADWALL | 410.4 | +68 | 276.1 | +49 | | 2.0 | -17 | 10.9 | -82 |
| AMERICAN WIGEON | 144.2 | -21 | 155.3 | -7 | | .4 | -20 | 1.0 | -60 |
| GREEN-WINGED TEAL | 58.7 | +59 | 65.6 | -11 | | 0.0 | N.C. | .9 | -100 |
| BLUE-WINGED TEAL | 934.8 | +27 | 814.5 | +15 | | 1.2 | -14 | 8.9 | -87 |
| NORTHERN SHOVELER | 472.5 | +70 | 231.5 | +104 | | .5 | | .4 | +25 |
| PINTAIL | 560.2 | -5 | 520.4 | +8 | | 1.9 | -59 | 2.7 | -30 |
| SUBTOTAL | 3,265.4 | +27 | 2,633.9 | +24 | | 8.9 | -41 | 38.3 | -77 |
| DIVERS: | | | | | | | | | |
| REDHEAD | 204.8 | +3 | 152.9 | +34 | | .7 | -80 | 1.6 | -56 |
| CANVASBACK | 64.4 | +164 | 31.9 | +102 | | .1 | -83 | .2 | -50 |
| SCAUP | 252.5 | +168 | 50.5 | +400 | | .3 | -40 | .5 | -40 |
| RING-NECKED | 57.4 | +348 | 7.6 | +655 | | 0.0 | N.C. | 0.0 | N.C. |
| AMERICAN GOLDENEYE | 0.0 | N.C. | .1 | -100 | | 0.0 | N.C. | 0.0 | N.C. |
| BUFFLEHEAD | 2.3 | +156 | .6 | +283 | | 0.0 | N.C. | 0.0 | N.C. |
| SUBTOTAL | 581.4 | +76 | 243.6 | +139 | | 1.1 | -76 | 2.3 | -52 |
| MISCELLANEOUS: | | | | | | | | | |
| OLDSQUAW | 0.0 | N.C. | 0.0 | N.C. | | 0.0 | N.C. | 0.0 | N.C. |
| FIDER | 0.0 | N.C. | 0.0 | N.C. | | 0.0 | N.C. | 0.0 | N.C. |
| SCOTER | 0.0 | N.C. | 0.0 | N.C. | | 0.0 | N.C. | 0.0 | N.C. |
| RUDDY DUCK | 135.2 | +21 | 133.8 | +1 | | 1.3 | -54 | 5.2 | -75 |
| MERGANSER | 0.0 | N.C. | .4 | -100 | | 0.0 | N.C. | 0.0 | N.C. |
| SUBTOTAL | 135.2 | +21 | 134.2 | +1 | | 1.3 | -54 | 5.2 | -75 |
| TOTAL DUCKS | 3,982.0 | +32 | 3,011.7 | +32 | | 11.3 | -50 | 45.8 | -75 |
| COOTS | | | | | | | | | |
| AMERICAN COOT | 1,386.6 | +265 | 305.3 | +354 | | | | | |
| GRAND TOTAL | 5,368.6 | +58 | 3,317.0 | +62 | | | | | |

TABLE B-9. SOUTH DAKOTA--1979 WATERFOWL BREEDING GROUND SURVEY RESULTS.

| | WATERFOWL BREEDING PAIR SURVEY (NUMBERS IN THOUSANDS) | | | | WATERFOWL PRODUCTION SURVEY (NUMBERS IN THOUSANDS) | | | | |
|--------------------|--|-----------------------|----------------------|--------------------------|---|-----------------------|----------------------|--------------------------|-----|
| | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | 1979 | % CHANGE FROM 1978 | 1969-1978 AVERAGE | % CHANGE FROM AVERAGE | |
| MAY PONDS | 367.8 | -14 | 381.6 | -4 | JULY PONDS | 213.3 | -13 | 247.0 | -14 |
| | | | | | DUCK BROOD INDEX | 28.7 | -37 | 32.4 | -11 |
| | | | | | AVG. BROOD SIZE | 5.146 | +19 | 5.027 | +2 |
| | BREEDING POPULATION ESTIMATES | | | | LATE-NESTING INDEXES | | | | |
| DUCKS: | | | | | | | | | |
| DABLERS: | | | | | | | | | |
| MALLARD | 482.9 | -10 | 424.8 | +14 | 7.4 | -24 | 12.8 | -42 | |
| BLACK DUCK | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| GADWALL | 147.5 | -37 | 160.5 | -8 | 2.2 | -69 | 7.2 | -69 | |
| AMERICAN WIGEON | 72.1 | -72 | 112.6 | -36 | 1.6 | -30 | 2.1 | -24 | |
| GREEN-WINGED TEAL | 31.4 | -52 | 53.4 | -41 | .3 | -57 | .6 | -50 | |
| BLUE-WINGED TEAL | 1,041.5 | -19 | 736.5 | +41 | .8 | -84 | 6.2 | -87 | |
| NORTHERN SHOVELER | 361.7 | -14 | 172.1 | +110 | .3 | -63 | .6 | -50 | |
| PINTAIL | 318.0 | -53 | 304.3 | +5 | .7 | -83 | 3.1 | -77 | |
| SUBTOTAL | 2,455.1 | -29 | 1,964.2 | +25 | 13.3 | -55 | 32.6 | -59 | |
| DIVERS: | | | | | | | | | |
| REDHEAD | 53.5 | -65 | 56.3 | -5 | 0.0 | -100 | .8 | -100 | |
| CANVASBACK | 8.3 | -54 | 9.9 | -16 | 0.0 | -100 | .1 | -100 | |
| SCAUP | 42.5 | -39 | 35.4 | +20 | 0.0 | -100 | .2 | -100 | |
| RING-NECKED | 4.3 | -7 | 1.8 | +139 | 0.0 | N.C. | 0.0 | N.C. | |
| AMERICAN GOLDENEYE | 0.0 | -100 | .2 | -100 | 0.0 | N.C. | 0.0 | N.C. | |
| BUFFLEHEAD | 1.4 | +250 | .2 | +600 | 0.0 | N.C. | 0.0 | N.C. | |
| SUBTOTAL | 110.0 | -55 | 103.8 | +6 | 0.0 | -100 | 1.1 | -100 | |
| MISCELLANEOUS: | | | | | | | | | |
| OLDSQUAW | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| FIDER | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | |
| SCOTER | 0.0 | N.C. | 0.0 | N.C. | 0.0 | N.C. | .1 | -100 | |
| RUDY DUCK | 21.3 | -48 | 63.3 | -66 | .8 | -62 | 2.2 | -64 | |
| MERGANSER | 1.6 | | 0.0 | | 0.0 | N.C. | 0.0 | N.C. | |
| SUBTOTAL | 22.9 | -44 | 63.3 | -64 | .8 | -62 | 2.3 | -65 | |
| TOTAL DUCKS | 2,588.0 | -31 | 2,131.3 | +21 | 14.1 | -61 | 36.0 | -61 | |
| COOTS | | | | | | | | | |
| AMERICAN COOT | 358.8 | +62 | 139.6 | +157 | | | | | |
| GRAND TOTAL | 2,946.8 | -26 | 2,270.9 | +30 | | | | | |

Table B-10. Minnesota--Estimated number of breeding ducks in the spring of 1979.

| Species | Unadjusted population index | Visibility factor | Adjusted population index | Percentage change from 1978 |
|------------------|-----------------------------|-------------------|---------------------------|-----------------------------|
| Mallard | 73,226 | 2.70 | 198,000 | + 5 |
| Blue-winged teal | 49,919 | 4.54 | 227,000 | -11 |
| Other ducks | 46,745 | 3.70 | 173,000 | + 2 |
| Total | 169,890 | | 598,000 | - 3 |

Table B-11. Breeding population estimates for ducks in Minnesota in recent years based on aerial censuses corrected for visibility.

| Year | Mallard | Blue-winged teal | All ducks |
|------|----------------------|----------------------|----------------------|
| 1970 | 111,000 | 153,000 | 316,000 |
| 1971 | 96,000 | 153,000 | 331,000 |
| 1972 | 69,000 | 100,000 | 258,000 |
| 1973 | 104,000 ^a | 136,000 ^a | 423,000 ^b |
| 1974 | 98,000 ^a | 112,000 ^a | 404,000 ^b |
| 1975 | 146,000 | 163,000 | 490,000 |
| 1976 | 152,000 | 387,000 | 697,000 |
| 1977 | 218,000 | 219,000 | 576,000 |
| 1978 | 189,000 | 256,000 | 615,000 |
| 1979 | 198,000 | 227,000 | 598,000 |

^aProcedural changes in data compilation initiated in 1975 have been used for revision of raw data in these years. Values represented here differ slightly from previous years.

^bTotal duck figures do not reflect the changes noted in footnote "a".

Table B-12. California--Estimated total nesting pairs and fall population indices in the Sacramento Valley, 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|-------------------|-------------------------------|--------|--------|--------|-------------------------|---------|---------|---------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 26,520 | 38,000 | 30,360 | 33,760 | 110,760 | 158,700 | 126,800 | 141,210 |
| Gadwall | 440 | 840 | 720 | 680 | 2,200 | 4,200 | 3,600 | 3,400 |
| Cinnamon teal | 2,200 | 3,960 | 2,080 | 3,960 | 8,220 | 14,780 | 7,770 | 14,790 |
| Northern shoveler | | 80 | 80 | 320 | | 360 | 360 | 1,430 |
| Pintail | 480 | 1,080 | 880 | 1,240 | 1,850 | 4,160 | 3,390 | 4,770 |
| Subtotal | 29,640 | 43,960 | 34,120 | 39,960 | 123,030 | 182,200 | 141,920 | 165,600 |
| Divers | | | | | | | | |
| Canvasback | 160 | 40 | | | 720 | 180 | | |
| Redhead | | | 240 | 280 | | | 1,080 | 1,250 |
| Scaup | | | | | | | | |
| Ruddy duck | 240 | | 200 | 120 | 1,150 | | 900 | 540 |
| Subtotal | 400 | 40 | 440 | 400 | 1,870 | 180 | 1,980 | 1,790 |
| Miscellaneous | 40 | 280 | 120 | 80 | 180 | 1,250 | 540 | 360 |
| Total ducks | 30,080 | 44,280 | 34,680 | 40,440 | 125,080 | 183,630 | 144,440 | 167,750 |
| Coot | 22,440 | 34,680 | 6,120 | 10,200 | 103,400 | 159,800 | 28,200 | 47,000 |

Table B-13. California--Estimated total nesting pairs and fall population indices for the Suisun Marsh, 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|----------------------|-------------------------------|-------|-------|-------|-------------------------|-------|--------|--------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 1,370 | 1,380 | 2,240 | 3,170 | 5,700 | 5,750 | 7,830 | 13,160 |
| Gadwall | 160 | 330 | 560 | 620 | 800 | 1,670 | 2,800 | 3,060 |
| Cinnamon teal | 240 | 330 | 460 | 820 | 900 | 1,250 | 1,690 | 3,030 |
| Northern shoveler | 60 | 10 | 30 | 160 | 260 | 60 | 130 | 720 |
| Pintail | 60 | 30 | 110 | 60 | 220 | 100 | 410 | 210 |
| Subtotal | 1,890 | 2,080 | 3,400 | 4,830 | 7,880 | 8,330 | 12,860 | 20,180 |
| Divers | | | | | | | | |
| Redhead | | | | | | | | |
| Ruddy duck | | | 20 | | | | 60 | |
| Subtotal | | | 20 | | | | 60 | |
| Miscellaneous | | | | | | | | |
| Total ducks | 1,890 | 2,080 | 3,420 | 4,830 | 7,880 | 8,330 | 12,920 | 20,180 |
| Coot | 560 | 1,600 | 260 | 100 | 2,580 | 7,350 | 1,170 | 430 |

Table B-14. California--Estimated total nesting pairs and fall population indices for the North San Joaquin Valley (Grasslands), 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|-------------------|-------------------------------|-------|-------|-------|-------------------------|--------|--------|--------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 1,470 | 1,590 | 2,230 | 1,740 | 4,580 | 5,170 | 7,240 | 5,650 |
| Gadwall | 710 | 840 | 900 | 1,080 | 2,230 | 2,650 | 2,820 | 3,380 |
| Cinnamon teal | 820 | 890 | 1,400 | 1,600 | 2,550 | 2,790 | 4,390 | 5,030 |
| Northern shoveler | 120 | 180 | 190 | 160 | 360 | 570 | 570 | 510 |
| Pintail | 120 | 140 | 320 | 270 | 350 | 430 | 1,000 | 830 |
| Subtotal | 3,240 | 3,640 | 5,040 | 4,850 | 10,070 | 11,610 | 16,020 | 15,400 |
| Divers | | | | | | | | |
| Canvasback | | | | 10 | | | | 20 |
| Redhead | 80 | 20 | 60 | 80 | 240 | 60 | 180 | 220 |
| Ruddy duck | 140 | 40 | 290 | 410 | 390 | 100 | 800 | 1,260 |
| Subtotal | 220 | 60 | 350 | 500 | 630 | 160 | 980 | 1,500 |
| Miscellaneous | | | 10 | | | | 10 | |
| Total ducks | 3,460 | 3,700 | 5,400 | 5,350 | 10,700 | 11,770 | 17,010 | 16,900 |
| Coot | 2,890 | 5,500 | 1,540 | 930 | 15,730 | 29,960 | 8,390 | 5,070 |

Table B-15. California--Estimated total nesting pairs and fall population indices for the South Joaquin Valley, 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|-------------------|-------------------------------|-------|-------|------|-------------------------|-------|--------|-------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 830 | 800 | 1,130 | 460 | 2,290 | 2,200 | 3,100 | 1,270 |
| Gadwall | 60 | 130 | 180 | 90 | 150 | 360 | 490 | 230 |
| Cinnamon teal | 180 | 170 | 490 | 170 | 470 | 470 | 1,340 | 450 |
| Northern shoveler | 20 | | 220 | 10 | 40 | | 590 | 30 |
| Pintail | 90 | 150 | 3,000 | 40 | 250 | 410 | 8,260 | 120 |
| Subtotal | 1,180 | 1,250 | 5,020 | 770 | 3,200 | 3,440 | 13,780 | 2,100 |
| Divers | | | | | | | | |
| Canvasback | | | 10 | | | | 20 | |
| Redhead | | 20 | 10 | 10 | | 40 | 20 | 20 |
| Ruddy duck | | | 10 | | | | 20 | |
| Scaup | | 40 | 160 | 30 | | 10 | 320 | 80 |
| Subtotal | | 60 | 190 | 40 | | 150 | 380 | 100 |
| Miscellaneous | | | 10 | | | | 20 | |
| Total ducks | 1,180 | 1,310 | 5,220 | 810 | 3,200 | 3,590 | 14,180 | 2,200 |
| Coot | 1,620 | 1,490 | 3,010 | 140 | 8,760 | 8,100 | 16,410 | 740 |

Table B-16. California--Estimated total nesting pairs and fall population indices for Northeastern California, 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|-------------------|-------------------------------|-------|-------|-------|-------------------------|---------------------|---------------------|---------------------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 4,710 | 4,360 | 2,760 | 3,920 | 30,610 | 28,340 | 17,930 | 25,480 |
| Gadwall | 1,020 | 1,140 | 600 | 1,150 | 8,030 | 8,960 | 4,710 | 9,020 |
| Cinnamon teal | 970 | 1,140 | 780 | 920 | 6,280 | 7,090 | 5,060 | 5,970 |
| Northern shoveler | 140 | 220 | 200 | 180 | 870 | 1,350 | 1,210 | 1,070 |
| Pintail | 900 | 730 | 1,940 | 1,900 | 5,160 | 4,220 | 11,140 | 10,900 |
| Subtotal | 7,740 | 7,590 | 6,280 | 8,070 | 50,950 | 49,960 | 40,050 | 52,440 |
| Divers | | | | | | | | |
| Canvasback | 70 | 30 | 10 | 60 | 320 | 130 | 60 | 280 |
| Redhead | 340 | 930 | 480 | 540 | 2,310 | 5,360 | 3,280 | 3,720 |
| Scaup | 70 | 250 | 150 | 230 | 410 | 1,550 | 830 | 1,380 |
| Ruddy duck | 110 | 200 | 140 | 80 | 620 | 1,150 | 760 | 440 |
| Subtotal | 590 | 1,410 | 780 | 910 | 3,660 | 8,190 | 4,930 | 5,820 |
| Miscellaneous | 110 | 140 | 220 | 240 | 550 | 690 | 1,080 | 1,180 |
| Total ducks | 8,440 | 9,140 | 7,280 | 9,220 | 55,160 | 58,840 | 46,060 | 59,440 |
| Canada goose | 510 | 425 | 780 | 840 | 15,330 ^a | 17,880 ^b | 18,000 ^c | 18,070 ^d |
| Coot | 1,160 | 2,030 | 1,360 | 1,020 | 6,950 | 12,170 | 8,140 | 6,110 |

^aIncludes 12,130 non-breeders.

^bIncludes 14,780 non-breeders.

^cIncludes 12,650 non-breeders.

^dIncludes 12,470 non-breeders.

Table B-17. California--Estimated total nesting pairs and fall population indices for the Klamath Basin, 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|-------------------|-------------------------------|-------|-------|--------|-------------------------|--------------------|--------------------|--------------------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 2,050 | 1,180 | 1,300 | 2,660 | 13,130 | 7,730 | 8,140 | 13,660 |
| Gadwall | 1,540 | 2,130 | 2,540 | 3,030 | 10,570 | 14,840 | 19,360 | 21,270 |
| Cinnamon teal | 3,660 | 3,070 | 1,850 | 2,720 | 23,790 | 19,280 | 12,570 | 17,230 |
| Northern shoveler | 110 | 310 | 440 | 870 | 680 | 1,970 | 2,680 | 5,460 |
| Pintail | 100 | 120 | 230 | 310 | 670 | 640 | 1,540 | 1,800 |
| Subtotal | 7,460 | 6,810 | 6,360 | 9,590 | 48,840 | 44,460 | 44,290 | 63,420 |
| Divers | | | | | | | | |
| Canvasback | 60 | 50 | 110 | 100 | 300 | 400 | 620 | 740 |
| Redhead | 1,050 | 840 | 480 | 770 | 6,230 | 5,230 | 3,450 | 5,110 |
| Scaup | 80 | 300 | 430 | 590 | 470 | 1,870 | 4,030 | 3,880 |
| Ruddy duck | 740 | 950 | 1,020 | 970 | 4,290 | 4,800 | 5,560 | 5,550 |
| Subtotal | 1,930 | 2,140 | 2,040 | 2,430 | 11,290 | 12,300 | 13,660 | 15,280 |
| Miscellaneous | 80 | 90 | 390 | 120 | 490 | 480 | 2,350 | 680 |
| Total ducks | 9,470 | 9,040 | 8,790 | 12,140 | 60,620 | 57,240 | 60,300 | 79,380 |
| Canada goose | 420 | 710 | 580 | 430 | 3,250 ^a | 3,780 ^b | 3,650 ^c | 2,330 ^d |
| Coot | 5,400 | 3,160 | 4,970 | 2,940 | 26,350 | 17,320 | 24,800 | 15,790 |

^aIncludes 1,320 non-breeders.

^bIncludes 1,080 non-breeders.

^cIncludes 850 non-breeders.

^dIncludes 310 non-breeders.

Table B-18. California--Estimated total nesting pairs and fall population indices for the entire State, 1976-1979.

| Species | Estimated total nesting pairs | | | | Fall population indices | | | |
|-------------------|-------------------------------|--------|--------|--------|-------------------------|---------|---------|---------|
| | 1976 | 1977 | 1978 | 1979 | 1976 | 1977 | 1978 | 1979 |
| Dabblers | | | | | | | | |
| Mallard | 36,950 | 47,310 | 40,020 | 45,710 | 167,070 | 207,890 | 171,040 | 204,430 |
| Gadwall | 3,930 | 5,410 | 5,500 | 6,650 | 23,980 | 32,680 | 33,780 | 40,360 |
| Cinnamon teal | 8,070 | 9,560 | 7,060 | 10,190 | 42,210 | 45,660 | 32,820 | 46,500 |
| Northern shoveler | 450 | 800 | 1,160 | 1,700 | 2,210 | 4,310 | 5,540 | 9,220 |
| Pintail | 1,750 | 2,250 | 6,480 | 3,820 | 8,500 | 9,960 | 25,740 | 18,630 |
| Subtotal | 51,150 | 65,330 | 60,220 | 68,070 | 243,970 | 300,500 | 268,920 | 319,140 |
| Divers | | | | | | | | |
| Canvasback | 130 | 80 | 130 | 170 | 620 | 530 | 700 | 1,040 |
| Redhead | 1,630 | 1,850 | 1,270 | 1,680 | 9,500 | 10,870 | 8,010 | 10,320 |
| Scaup | 150 | 550 | 590 | 820 | 880 | 3,420 | 4,880 | 5,260 |
| Ruddy duck | 1,230 | 1,230 | 1,830 | 1,610 | 6,450 | 6,160 | 8,400 | 7,870 |
| Subtotal | 3,140 | 3,710 | 3,820 | 4,280 | 17,450 | 20,980 | 21,990 | 24,490 |
| Miscellaneous | 230 | 510 | 750 | 440 | 1,220 | 2,420 | 4,000 | 2,220 |
| Total ducks | 54,520 | 69,550 | 64,790 | 72,790 | 262,640 | 323,900 | 294,910 | 345,850 |
| Canada goose | 930 | 1,135 | 1,360 | 1,270 | 18,580 | 21,660 | 21,650 | 20,400 |
| Coot | 34,070 | 48,460 | 17,260 | 15,330 | 163,770 | 234,700 | 87,110 | 75,140 |

Table B-19. Colorado--Summary of duck breeding population estimates in selected areas, 1979.

| Area | Total estimated breeding pairs | | | Percent change | |
|-------------------------|--------------------------------|--------|--------------------------------|----------------|------------------------|
| | 1979 | 1978 | Long-term average ^a | From 1978 | From long-term average |
| San Luis Valley | 17,140 | 28,524 | 27,900 | -40 | -39 |
| North Park ^b | 16,882 | 9,633 | 16,435 | +75 | + 2 |
| South Platte Valley | 9,794 | 19,182 | 7,313 | -49 | +34 |
| Cache la Poudre Valley | 5,018 | 12,674 | 4,054 | -60 | +24 |
| Yampa Valley | 1,897 | 1,708 | 2,686 | +11 | -29 |
| Brown's Park | 953 | 805 | 1,126 | +18 | -15 |
| Total | 51,624 | 72,526 | 59,514 | -29 | -13 |

^aSan Luis Valley and North Park averages are based on results of 1964 through 1975 and 1968 through 1978 surveys, respectively, because of changes in survey methods utilized prior to those dates. Figures for other areas are 23-year averages.

^bAerial counts corrected by species from visibility ratios obtained in the San Luis Valley.

Table B-20. Colorado--Species composition of 1979 duck breeding pair population.

| Species | Number of breeding pairs | | | Percent species composition | | |
|----------------------------------|--------------------------|--------|---------------------------------|-----------------------------|------|----------------------|
| | 1979 | 1978 | 1954-78 average ^a | 1979 | 1978 | 1954-1978 average |
| Mallard | 15,456 | 21,313 | 27,580 | 30 | 29 | 51 |
| Blue-winged and cinnamon teal | 6,349 | 9,267 | 5,913 | 12 | 13 | 11 |
| Gadwall | 4,838 | 14,311 | 5,676 | 9 | 20 | 10 |
| Pintail | 3,297 | 3,557 | 3,605 | 6 | 5 | 7 |
| Green-winged teal | 5,719 | 12,739 | 3,178 | 11 | 18 | 6 |
| Northern shoveler | 2,891 | 5,866 | 3,545 | 6 | 8 | 7 |
| American wigeon | 1,204 | 978 | 1,131 | 2 | 1 | 2 |
| Redhead | 9,707 | 543 | 2,237 | 19 | 1 | 4 |
| Other divers | 2,163 | 3,952 | 1,664 | 4 | 5 | 3 |
| Total | 51,624 | 72,526 | 54,529 | | | |

^aSpecies composition computed from data from all areas for the 23-year period regardless of changes in survey method.

Table B-21. Colorado--Number of Canada geese observed, and estimated production in Moffat County, 1979.

| Area | Nesting pairs | Non-nesting birds | Total adults | Estimated No. goslings ^a | Total birds |
|--------------------------------|---------------|-------------------|--------------|-------------------------------------|-------------|
| Yampa River | | | | | |
| Craig-Juniper Springs | 17 | 288 | 322 | 71 | 393 |
| Juniper Springs-Cross Mountain | 21 | 124 | 166 | 84 | 250 |
| Lilly Park | 12 | 143 | 167 | 44 | 211 |
| Subtotal | 50 | 555 | 655 | 199 | 854 |
| Green River | | | | | |
| Brown's Park ^b | 58 | | | | |
| Dinosaur National Monument | 39 | 139 | 217 | 172 | 389 |
| Subtotal | 97 | | | | |
| Little Snake River | 27 | 180 | 234 | 104 | 338 |
| Total | 174 | | | | |

^aCalculated using average brood size observed and number of successful nests.

^bData for Brown's Park incomplete.

Table B-22. Colorado--Total Canada geese observed, Moffat County, 1979.

| Area | 1979 | 1978 | 1967-1978 average | Percent change | |
|--|------|-------|----------------------|------------------|---------------------------|
| | | | | From 1978 | From 1967-1978 average |
| Yampa River | 854 | 586 | 577 | +46 | +48 |
| Green River Brown's Park | | 527 | 364 | | |
| Dinosaur National Monument ^a | 389 | 406 | 386 | - 4 | + 1 |
| Little Snake River | 338 | 191 | 287 | +77 | +18 |
| Total | | 1,710 | 1,614 | +34 ^b | +27 ^b |

^aNot surveyed until 1970

^bPercent change does not include Green River, Brown's Park data.

Table B-23. Colorado--Estimated number of Canada goose goslings, Moffat County, 1979.

| Area | 1979 | 1978 | 1967-1978 average | Percent change | |
|--|------|------|----------------------|------------------|---------------------------|
| | | | | From 1978 | From 1967-1978 average |
| Yampa River | 199 | 200 | 172 | - 1 | +16 |
| Green River Brown's Park | | 285 | 148 | | |
| Dinosaur National Monument ^a | 172 | 198 | 159 | -13 | + 8 |
| Little Snake River | 104 | 90 | 93 | +16 | +12 |
| Total | | 773 | 572 | - 3 ^b | +12 ^b |

^aNot surveyed until 1970.

^bPercent change does not include Green River, Brown's Park data.

Table B-24. Colorado--Number of adult Canada geese observed in north central Colorado production trend areas, 1979.

| Area | Number of geese | | | Percent change | |
|-------------|-----------------|-------|-------------------|----------------|----------------|
| | 1979 | 1978 | 1969-1978 average | From 1978 | From 1969-1978 |
| Wellington | 711 | 643 | 725 | +11 | - 2 |
| Ft. Collins | 663 | 850 | 709 | -22 | - 7 |
| Loveland | 374 | 166 | 218 | +125 | +72 |
| Boulder | 286 | 383 | 573 | -25 | -50 |
| Denver | 1,147 | 1,228 | 1,227 | - 7 | - 7 |
| Total | 3,181 | 3,270 | 3,452 | - 3 | - 8 |

Table B-25. Colorado--Number of Canada goose goslings produced in north central Colorado production trend areas, 1979.

| Area | Number of goslings | | | Percent change | |
|-------------|--------------------|------|-------------------|----------------|----------------|
| | 1979 | 1978 | 1969-1978 average | From 1978 | From 1969-1978 |
| Wellington | 290 | 175 | 248 | +66 | +17 |
| Ft. Collins | 378 | 276 | 284 | +37 | +33 |
| Loveland | 158 | 133 | 100 | +19 | +58 |
| Boulder | 181 | 166 | 211 | + 9 | -14 |
| Denver | 310 | 156 | 278 | +99 | +12 |
| Total | 1,317 | 906 | 1,211 | +45 | +18 |

Table B-26. Nebraska--Sandhills breeding population composition and change, 1979^a.

| Species | 1979 total | 1978 total | Percent change | Percent composition |
|-------------------|---------------|---------------|-------------------|------------------------|
| Mallard | 33,587 | 29,043 | + 16 | 23 |
| Blue-winged teal | 46,938 | 44,042 | + 7 | 33 |
| Green-winged teal | 491 | 520 | - 6 | TR |
| Pintail | 9,448 | 9,818 | - 4 | 7 |
| Gadwall | 20,241 | 14,960 | + 35 | 14 |
| Shoveler | 19,735 | 18,047 | + 9 | 14 |
| Wood duck | 246 | | | TR |
| Redhead | 6,632 | 3,298 | +101 | 5 |
| Canvasback | 2,948 | 729 | +304 | 2 |
| Scaup | 1,474 | 5,237 | - 72 | 1 |
| Ruddy | 2,049 | 312 | +557 | 1 |
| Total | 143,789 | 126,006 | + 14 | 100 |

^aBased on data from aerial surveys.

Table B-27. Nebraska--Rainwater Basin breeding population composition and change, 1979^a.

| Species | 1979 total | 1978 total | Percent change | Percent composition |
|------------------|---------------|---------------|-------------------|------------------------|
| Mallard | 4,984 | 6,442 | + 23 | 34 |
| Blue-winged teal | 7,313 | 3,395 | +115 | 49 |
| Pintail | | 98 | | |
| Gadwall | 816 | 363 | +125 | 6 |
| Shoveler | 1,216 | 3,130 | - 61 | 8 |
| Baldpate | | 363 | | |
| Redhead | 297 | | | 2 |
| Scaup | 208 | 182 | + 14 | 1 |
| Total | 14,834 | 13,973 | + 6 | 100 |

^aBased on data from aerial surveys.

Table B-28. Washington--Duck and coot breeding population indexes by species and stratum for 1979, 1978, and the 1969-78 average.

| Species | W. Wash. | Potholes | Irrig. | Highlands | 1979 | 1978 | 1969-78 Average | % Change from Average 1978 | |
|----------------------------------|----------|----------|--------|-----------|---------|---------|--------------------|-------------------------------|-----|
| Dabblers | | | | | | | | | |
| Mallard | 12,500 | 22,340 | 25,450 | 7,110 | 67,400 | 48,660 | 55,390 | +22 | +39 |
| Gadwall | | 8,540 | 1,380 | 170 | 10,090 | 6,150 | 6,130 | +65 | +64 |
| Wigeon | | 8,040 | 140 | 760 | 8,940 | 8,500 | 9,030 | - 1 | + 5 |
| Green-winged teal | 30 | 5,610 | 430 | 900 | 6,970 | 6,180 | 6,590 | + 6 | +13 |
| Blue-winged and cinnamon teal | 1,490 | 15,480 | 10,210 | 2,260 | 29,440 | 22,900 | 36,200 | -19 | +29 |
| Shoveler | | 5,260 | 600 | 170 | 6,030 | 4,540 | 6,190 | - 3 | +33 |
| Pintail | 30 | 4,990 | 340 | 70 | 5,430 | 7,360 | 7,500 | -28 | -26 |
| Wood duck | 7,760 | | 1,140 | 80 | 8,980 | 6,750 | 7,120 | +26 | +33 |
| Subtotal | 21,810 | 70,260 | 39,690 | 11,520 | 143,280 | 111,040 | 134,150 | + 7 | +29 |
| Divers | | | | | | | | | |
| Redhead | | 12,230 | 4,630 | 1,020 | 17,880 | 12,350 | 15,190 | +18 | +45 |
| Canvasback | | 30 | | | 30 | 270 | 400 | -93 | -89 |
| Scaup | | 5,840 | 1,010 | 600 | 7,450 | 8,670 | 8,170 | - 9 | -14 |
| Ringnecked duck | | 1,700 | 430 | 890 | 3,020 | 5,120 | 3,480 | -13 | -41 |
| Goldeneye | | 780 | | 1,660 | 2,440 | 2,590 | 2,840 | -14 | - 6 |
| Bufflehead | | 170 | | 40 | 210 | 1,090 | 490 | -57 | -81 |
| Ruddy duck | | 8,950 | 3,370 | 1,020 | 13,340 | 13,200 | 12,460 | + 7 | + 1 |
| White-winged scoter | | | | 40 | 40 | | | | |
| Subtotal | | 29,700 | 9,440 | 5,270 | 44,410 | 43,290 | 43,030 | + 3 | + 3 |
| Mergansers | | | | | | | | | |
| American | 70 | | | | 70 | 480 | 1,440 | -95 | -85 |
| Hooded | 190 | | | | 190 | 520 | 230 | -17 | -63 |
| Subtotal | 260 | | | | 260 | 1,000 | 1,670 | -84 | -74 |
| Total ducks | 22,070 | 99,960 | 49,130 | 16,790 | 187,950 | 155,970 | 178,850 | + 5 | +21 |
| Coot | 3,630 | 31,690 | 15,030 | 5,970 | 56,320 | 31,540 | 38,850 | +45 | +79 |
| Grand total | 25,700 | 131,650 | 64,160 | 22,760 | 244,270 | 187,510 | 217,700 | +12 | +30 |

Table B-29. Washington--Waterfowl production indexes for 1979, 1978, and the 1969-78 average.

| Species | Year | | | Percent change | |
|----------------------------------|---------|---------|-----------------|----------------|-----------|
| | 1979 | 1978 | 1969-78 average | From average | From 1978 |
| Dabblers | | | | | |
| Mallard | 232,100 | 131,100 | 144,500 | + 61 | + 77 |
| Gadwall | 34,400 | 12,400 | 13,100 | +163 | +177 |
| Wigeon | 29,600 | 16,900 | 27,700 | + 7 | + 75 |
| Green-winged teal | 20,200 | 12,400 | 16,100 | + 25 | + 63 |
| Blue-winged and cinnamon teal | 92,700 | 48,200 | 93,800 | NC | + 94 |
| Shoveler | 21,700 | 7,500 | 19,100 | + 14 | +189 |
| Pintail | 21,300 | 13,700 | 22,800 | - 7 | + 55 |
| Wood duck | 23,900 | 25,100 | 20,100 | + 19 | - 5 |
| Subtotal | 476,900 | 267,300 | 357,200 | + 34 | + 78 |
| Divers | | | | | |
| Redhead | 43,500 | 23,000 | 31,000 | + 40 | + 89 |
| Canvasback | 100 | 600 | 700 | - 86 | - 83 |
| Scaup | 16,100 | 12,400 | 14,700 | + 10 | + 30 |
| Ring-necked duck | 5,600 | 6,200 | 5,600 | NC | - 10 |
| Goldeneye | 6,500 | 4,000 | 8,700 | - 25 | + 63 |
| Bufflehead | 500 | 1,400 | 600 | - 17 | - 64 |
| Ruddy duck | 32,700 | 23,300 | 23,400 | + 40 | + 40 |
| White-winged scoter | TR | | | | |
| Subtotal | 105,000 | 70,900 | 84,700 | + 24 | + 48 |
| Mergansers | | | | | |
| American | 900 | 3,400 | 3,200 | - 72 | - 74 |
| Hooded | 200 | 500 | 500 | - 60 | - 60 |
| Total ducks | 583,000 | 342,000 | 445,600 | + 31 | + 70 |
| Canada goose | 12,900 | 14,000 | 12,300 | + 5 | - 8 |
| Coot | 93,400 | 48,700 | 58,900 | + 59 | - 92 |
| Grand total | 689,300 | 404,800 | 516,800 | + 33 | + 70 |

Table B-30. Wisconsin--Wetland densities by region, 1978-1979.

| Wetland type | Wetlands recorded per square kilometer | | | | | |
|--------------|--|------|---------------|------|--------------|------|
| | SE/central | | Northern high | | Northern low | |
| | 1979 | 1978 | 1979 | 1978 | 1979 | 1978 |
| I, II | 6 | 3 | 4 | 4 | 4 | 2 |
| III | 1 | 1 | 6 | 1 | TR | TR |
| IV, V | 3 | 2 | 3 | 3 | 2 | 2 |
| VII, VIII | 2 | 1 | 5 | 2 | 5 | 2 |
| Streams | 2 | 2 | 3 | 2 | 4 | 3 |
| Ditches | 3 | 2 | TR | TR | 1 | 1 |

Table B-31. Wisconsin--Adjusted breeding duck population estimate for 1979, 1978, and the 1973-78 average.

| Species | Number of breeding ducks ^b | | | | | | | | 1973-78 average |
|-----------------------------|---------------------------------------|---------|---------------|--------|--------------|--------|-------------|---------|--------------------|
| | SE/central | | Northern high | | Northern low | | All regions | | |
| | 1979 | 1978 | 1979 | 1978 | 1979 | 1978 | 1979 | 1978 | |
| Mallard | 52,800 | 30,000 | 30,000 | 28,300 | 12,000 | 21,200 | 95,200 | 79,500 | 84,700 |
| Blue-winged teal | 96,500 | 62,300 | 21,800 | 20,300 | 12,200 | 18,300 | 130,500 | 100,800 | 164,400 |
| Other ^a | 13,300 | 22,900 | 8,200 | 30,700 | 75,400 | 6,900 | 96,900 | 60,500 | 52,800 |
| Total | 162,600 | 115,200 | 60,000 | 79,300 | 100,000 | 46,400 | 322,600 | 240,800 | 301,400 |
| Percent change 1978-1979 | +41 | | -24 | | +116 | | +34 | | |

^aIncluded are wood duck, black duck, northern shoveler, pintail, ring-necked duck, redhead green-winged teal, gadwall, American wigeon, ruddy duck, and hooded merganser.

^bAll estimates rounded to nearest hundred.

APPENDIX C. WATERFOWL HARVEST SURVEY TABLES

Table C-1. Average differences between the waterfowl harvest by in-State duck stamp buyers regardless of State of kill, and the harvest by in-State hunters regardless of State of purchase (1966-75).

| Flyway/State | Duck harvest by | | | Goose harvest by | | |
|----------------------------------|-------------------|---------------|----------------|-------------------|---------------|----------------|
| | State of purchase | State of kill | Percent change | State of purchase | State of kill | Percent change |
| Atlantic Flyway | | | | | | |
| Connecticut | 39,700 | 39,712 | NC | 2,560 | 1,745 | -32 |
| Delaware | 48,120 | 43,734 | - 9 | 32,310 | 32,097 | - 1 |
| District of Columbia | 6,900 | 0 | -100 | 4,830 | 0 | -100 |
| Florida | 221,780 | 225,505 | + 2 | 1,060 | 89 | -92 |
| Georgia | 59,100 | 56,499 | - 4 | 600 | 75 | -87 |
| Maine | 84,960 | 88,869 | + 5 | 1,440 | 1,612 | +12 |
| Maryland | 124,470 | 128,967 | + 4 | 109,880 | 129,296 | +18 |
| Massachusetts | 91,770 | 86,600 | - 6 | 5,180 | 4,900 | - 5 |
| New Hampshire | 24,270 | 24,790 | + 2 | 930 | 868 | - 7 |
| New Jersey | 130,620 | 129,453 | - 1 | 31,510 | 26,196 | -17 |
| New York | 294,720 | 291,263 | - 1 | 42,740 | 42,005 | - 2 |
| North Carolina | 116,880 | 126,214 | + 8 | 8,850 | 10,566 | +19 |
| Pennsylvania | 125,850 | 128,496 | + 2 | 18,550 | 15,566 | -16 |
| Rhode Island | 14,410 | 15,201 | + 5 | 930 | 780 | -16 |
| South Carolina | 118,530 | 123,571 | + 4 | 1,330 | 523 | -61 |
| Vermont | 30,640 | 33,356 | + 9 | 1,480 | 1,703 | +15 |
| Virginia | 107,200 | 97,086 | - 9 | 13,250 | 9,895 | -25 |
| West Virginia | 4,880 | 5,532 | +13 | 180 | 104 | -42 |
| Flyway total | 1,644,780 | 1,644,848 | NC | 277,550 | 278,031 | NC |
| Mississippi Flyway | | | | | | |
| Alabama | 67,450 | 68,526 | + 2 | 2,770 | 2,564 | - 7 |
| Arkansas | 427,270 | 476,553 | +12 | 2,510 | 1,628 | -35 |
| Illinois | 341,870 | 331,984 | - 3 | 35,720 | 37,558 | + 5 |
| Indiana | 79,830 | 76,066 | - 5 | 5,330 | 4,107 | -23 |
| Iowa | 280,250 | 277,022 | - 1 | 42,800 | 45,111 | + 5 |
| Kentucky | 38,450 | 40,943 | + 6 | 9,010 | 8,752 | - 3 |
| Louisiana | 1,257,260 | 1,254,261 | NC | 97,540 | 90,801 | - 7 |
| Michigan | 341,970 | 348,354 | + 2 | 21,230 | 21,517 | + 1 |
| Minnesota | 914,420 | 890,469 | - 3 | 50,000 | 41,157 | -18 |
| Mississippi | 173,930 | 170,264 | - 2 | 2,780 | 1,940 | -30 |
| Missouri | 227,710 | 227,548 | NC | 66,030 | 71,023 | + 8 |
| Ohio | 125,120 | 118,946 | - 5 | 8,750 | 8,066 | - 8 |
| Tennessee | 175,710 | 129,341 | -26 | 6,350 | 5,747 | - 9 |
| Wisconsin | 550,060 | 568,463 | + 3 | 47,770 | 49,798 | + 4 |
| Flyway total | 5,001,240 | 4,978,740 | NC | 398,580 | 389,757 | - 2 |
| Central Flyway | | | | | | |
| Colorado | 137,500 | 139,465 | + 1 | 18,470 | 20,147 | + 9 |
| Kansas | 303,820 | 307,169 | + 1 | 27,240 | 22,646 | -17 |
| Montana | 37,060 | 38,012 | + 3 | 3,830 | 4,104 | + 7 |
| Nebraska | 254,490 | 250,645 | - 2 | 28,610 | 22,389 | -22 |
| New Mexico | 30,810 | 30,118 | - 2 | 1,890 | 1,978 | + 5 |
| North Dakota | 339,840 | 356,051 | + 5 | 83,860 | 92,181 | +10 |
| Oklahoma | 183,600 | 188,027 | + 2 | 12,220 | 13,239 | + 8 |
| South Dakota | 231,120 | 262,063 | +13 | 55,490 | 56,420 | + 2 |
| Texas | 857,060 | 852,963 | NC | 160,150 | 167,647 | + 5 |
| Wyoming | 32,600 | 32,214 | - 1 | 1,970 | 1,838 | - 7 |
| Flyway total | 2,437,550 | 2,456,727 | + 1 | 393,740 | 402,589 | + 2 |
| Pacific Flyway | | | | | | |
| Arizona | 67,090 | 72,155 | + 8 | 1,810 | 2,946 | +63 |
| California | 1,960,170 | 1,959,827 | NC | 226,260 | 226,442 | NC |
| Colorado | 22,770 | 24,834 | + 9 | 590 | 369 | -37 |
| Idaho | 286,320 | 295,899 | + 3 | 14,410 | 14,951 | + 4 |
| Montana | 123,660 | 127,472 | + 3 | 6,130 | 6,030 | - 2 |
| Nevada | 104,310 | 103,491 | - 1 | 7,580 | 6,881 | - 9 |
| New Mexico | 4,480 | 5,607 | +25 | 100 | 41 | -59 |
| Oregon | 375,020 | 374,470 | NC | 42,250 | 42,440 | NC |
| Utah | 312,080 | 304,918 | - 2 | 11,960 | 11,343 | - 5 |
| Washington | 532,780 | 530,708 | NC | 39,760 | 39,232 | - 1 |
| Wyoming | 10,530 | 11,307 | + 7 | 1,030 | 1,231 | +20 |
| Flyway total | 3,799,170 | 3,810,688 | NC | 351,870 | 351,906 | NC |
| Alaska | 69,080 | 65,280 | - 6 | 12,340 | 11,775 | - 5 |
| United States total ^a | 12,951,820 | 12,956,283 | NC | 1,434,060 | 1,433,969 | NC |

^aThe difference between United States totals is due to rounding.

Table C-2. Calculating the size and geographic distribution of the waterfowl harvest.

1. Expanding Means

$$\text{Seasonal}^{a,b,c} \text{ zone mean} \times \text{Zone stamps} \times \text{Philatelic response factor} \times \text{Response bias adjustment}^d \times \text{Junior hunter}^e \text{ expansion} \times \text{Questionnaire change adjustment} = \text{Zone total}^f$$

2. State Duck Harvest

$$\text{Zone total duck harvest} \div \text{Total zone}^{a,c} \text{ duck wings} = \text{Zone duck harvest per zone wing} \longrightarrow \text{Code this value into each wing record} \longrightarrow \text{Resort wing records by State of kill and sum values}$$

3. Sea Duck Harvest (ME,NH,MA,RI,CT,NY,MD only)

$$\text{Sum zone sea duck harvest} \longrightarrow \text{Total sea duck harvest by State of purchase} \div \text{Total sea duck wings by State of purchase} = \text{Harvest per wing by State of purchase} \longrightarrow \text{Code this value into each wing record} \longrightarrow \text{Resort wing records by State of kill and sum values}$$

4. Teal Season Duck Harvest (teal season states only)

$$\text{Sum zone teal season harvest} \longrightarrow \text{Total teal season duck harvest by State of purchase} \div \text{Total teal season wings by State of kill} = \text{Considered as harvest per wing by State of kill} \longrightarrow \text{Code this value into each wing record} \longrightarrow \text{Sort wing records by State of kill and sum values}$$

5. State Goose Harvest

$$\text{Sum zone goose harvest} \longrightarrow \text{Total goose harvest by State of purchase} \div \text{Total goose tails by State of purchase} = \text{Harvest per tail by State of purchase} \longrightarrow \text{Code this value into each tail record} \longrightarrow \text{Resort tail records by State of kill and sum values}$$

6. State Coot Harvest, Hunter Days, or Unretrieved Kill

$$\text{Sum zone totals} = \text{Total by State of purchase} \qquad \text{No further computations are made.}$$

^aIn all but seven Atlantic Flyway states, means and wings for ducks and sea ducks are combined.

^bSeptember teal season duck means are adjusted downward based on past comparisons of questionnaires sent to all potential hunters compared with questionnaires sent only to potential teal season hunters.

^cIn states having September teal seasons, adjusted means and wings for that season are subtracted from retrieved duck means and total zone duck wings.

^dThere is no bias adjustment for unretrieved kill or hunter days.

^eThere is no expansion for junior hunters for sea ducks in ME, NH, MA, RI, CT, NY only.

^fTotal duck harvest for each state of kill is the sum of harvest values for items 2, 3, and 4.

Table C-3. Factors used to adjust survey statistics for memory and prestige bias.

| Estimate | Memory and prestige response bias factors | | | |
|------------------------------------|---|--------------------|----------------|---------------------------|
| | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway and Alaska |
| Ducks bagged (including sea ducks) | 0.86925 | 0.77656 | 0.73902 | 0.78952 |
| Geese bagged | 0.80428 | 0.84800 | 0.86838 | 0.85159 |
| Coots bagged | 0.60692 | 0.63668 | 0.78878 | 0.59248 |

Table C-4. Factors used to adjust survey statistics to include the activities of junior hunters.

| Estimate | Junior hunter adjustment factors | | | |
|------------------------------------|----------------------------------|--------------------|----------------|---------------------------|
| | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway and Alaska |
| Ducks bagged (including sea ducks) | 1.03621 | 1.04655 | 1.06055 | 1.04985 |
| Geese bagged | 1.02402 | 1.03369 | 1.04110 | 1.04508 |
| Coots bagged | 1.08302 | 1.09034 | 1.10147 | 1.09415 |
| Days hunted | 1.05174 | 1.07003 | 1.08559 | 1.08708 |
| Ducks lost | 1.03641 | 1.05699 | 1.07053 | 1.06152 |
| Geese lost | 1.01573 | 1.03738 | 1.07067 | 1.07411 |
| Coots lost | 1.08247 | 1.10282 | 1.10400 | 1.10685 |

Table C-5. Total retrieved (by species) and unretrieved duck and coot kill in the United States during the 1977 and 1978 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters).

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|---------------------|----------|-----------------|--------------------|----------------|----------------|--------|---------------------|
| Retrieved duck kill | | | | | | | |
| Mallard | 1977 | 388,100 | 2,270,200 | 789,700 | 987,900 | 32,200 | 4,468,100 |
| | 1978 | 442,400 | 2,257,100 | 1,059,800 | 1,265,600 | 40,800 | 5,065,600 |
| | % change | +14 | - 1 | +34 | +28 | +27 | +13 |
| Domestic mallard | 1977 | 8,300 | 5,200 | 100 | 800 | | 14,400 |
| | 1978 | 7,600 | 5,800 | 600 | 1,500 | | 15,500 |
| | % change | - 8 | +12 | +500 | +88 | | + 8 |
| Black duck | 1977 | 195,000 | 78,900 | 200 | | | 274,100 |
| | 1978 | 262,300 | 78,800 | | | | 337,100 |
| | % change | +35 | - 5 | -100 | | | +23 |
| Black X mallard | 1977 | 10,900 | 4,500 | | | | 15,400 |
| | 1978 | 15,600 | 5,800 | 600 | | | 22,000 |
| | % change | +43 | +29 | + | | | +43 |
| Mottled duck | 1977 | 11,700 | 46,300 | 49,800 | | | 107,700 |
| | 1978 | 18,300 | 52,200 | 49,800 | | | 120,300 |
| | % change | +56 | +13 | NC | | | +12 |
| Gadwall | 1977 | 33,500 | 376,800 | 239,800 | 86,900 | 700 | 737,700 |
| | 1978 | 40,300 | 493,200 | 309,100 | 133,600 | 600 | 976,800 |
| | % change | +20 | +31 | +29 | +54 | -14 | +32 |
| American wigeon | 1977 | 74,300 | 260,400 | 204,100 | 373,300 | 11,900 | 924,000 |
| | 1978 | 78,200 | 337,400 | 210,200 | 411,500 | 16,200 | 1,053,600 |
| | % change | + 5 | +30 | + 3 | +10 | +36 | +14 |

Table C-5. Continued.

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|-------------------------------|----------|-----------------|--------------------|----------------|----------------|--------|---------------------|
| Green-winged teal | 1977 | 119,900 | 694,300 | 469,300 | 563,900 | 17,000 | 1,864,400 |
| | 1978 | 157,500 | 662,400 | 457,100 | 701,400 | 18,200 | 1,996,700 |
| | % change | +31 | - 5 | - 3 | +24 | + 7 | + 7 |
| Blue-winged and cinnamon teal | 1977 | 48,000 | 472,400 | 135,200 | 79,600 | 700 | 735,900 |
| | 1978 | 89,000 | 584,300 | 209,100 | 85,000 | 100 | 967,500 |
| | % change | +85 | +24 | +55 | + 7 | -86 | +31 |
| Northern shoveler | 1977 | 10,100 | 121,500 | 80,500 | 167,300 | 5,900 | 385,300 |
| | 1978 | 14,500 | 171,900 | 129,500 | 214,000 | 5,200 | 535,500 |
| | % change | +44 | +41 | +61 | +28 | -12 | +39 |
| Pintail | 1977 | 50,600 | 213,600 | 179,900 | 540,800 | 26,900 | 1,011,800 |
| | 1978 | 35,700 | 210,700 | 239,400 | 851,700 | 18,900 | 1,356,400 |
| | % change | -29 | - 1 | +33 | +57 | -30 | +34 |
| Wood duck | 1977 | 342,800 | 578,900 | 66,700 | 38,600 | | 1,027,000 |
| | 1978 | 407,400 | 741,800 | 79,600 | 46,500 | | 1,275,300 |
| | % change | +19 | +28 | +19 | +20 | | +24 |
| Redhead | 1977 | 8,500 | 28,100 | 41,800 | 26,600 | 200 | 105,200 |
| | 1978 | 8,600 | 63,500 | 58,600 | 37,100 | 100 | 167,900 |
| | % change | + 1 | +126 | +40 | +39 | -50 | +60 |
| Canvasback | 1977 | 7,000 | 24,800 | 10,800 | 32,500 | 400 | 75,500 |
| | 1978 | 5,500 | 20,400 | 7,000 | 31,100 | 300 | 64,200 |
| | % change | -21 | -18 | -35 | - 4 | -25 | -15 |
| Greater scaup | 1977 | 71,400 | 26,700 | 3,800 | 29,200 | 1,400 | 132,500 |
| | 1978 | 28,500 | 20,700 | 1,800 | 7,800 | 2,300 | 61,000 |
| | % change | -60 | -22 | -53 | -73 | +64 | -54 |

Table C-5. Continued.

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|------------------|----------|-----------------|--------------------|----------------|----------------|--------|---------------------|
| Lesser scaup | 1977 | 199,000 | 364,500 | 75,700 | 45,300 | 2,300 | 686,800 |
| | 1978 | 39,600 | 177,400 | 59,200 | 38,800 | 1,800 | 316,900 |
| | % change | -80 | -51 | -22 | -14 | -22 | -54 |
| Ring-necked duck | 1977 | 99,800 | 253,500 | 62,600 | 21,300 | 400 | 437,700 |
| | 1978 | 126,200 | 302,900 | 57,500 | 32,700 | 200 | 519,500 |
| | % change | +26 | +19 | - 8 | +54 | -50 | +19 |
| Goldeneye | 1977 | 18,700 | 21,200 | 5,900 | 25,400 | 4,000 | 75,300 |
| | 1978 | 24,000 | 30,400 | 8,600 | 31,800 | 4,400 | 99,300 |
| | % change | +28 | +43 | +46 | +25 | +10 | +32 |
| Bufflehead | 1977 | 69,700 | 42,700 | 12,300 | 27,000 | 2,800 | 154,500 |
| | 1978 | 50,600 | 50,600 | 17,800 | 39,400 | 5,400 | 163,800 |
| | % change | -27 | +19 | +45 | +46 | +193 | + 6 |
| Ruddy duck | 1977 | 6,000 | 10,500 | 3,300 | 19,200 | | 38,900 |
| | 1978 | 6,900 | 25,300 | 5,700 | 26,300 | | 64,200 |
| | % change | +15 | +141 | +73 | +37 | | +65 |
| Oldsquaw | 1977 | 8,300 | 700 | 100 | | 500 | 9,600 |
| | 1978 | 6,900 | 100 | | 600 | 1,600 | 9,300 |
| | % change | -17 | -86 | -100 | + | +220 | - 3 |
| Eiders | 1977 | 14,500 | | | | 200 | 14,700 |
| | 1978 | 15,700 | 100 | | | | 15,800 |
| | % change | + 8 | + | | | -100 | + 7 |
| Scoters | 1977 | 50,200 | 9,100 | 900 | 7,200 | 300 | 67,700 |
| | 1978 | 35,000 | 1,000 | | 5,400 | 5,300 | 46,600 |
| | % change | -30 | -89 | -100 | -25 | + | -31 |

Table C-5. Continued.

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|------------------|----------|-----------------|--------------------|----------------|----------------|--------|---------------------|
| Hooded merganser | 1977 | 24,500 | 39,100 | 3,600 | 3,500 | | 70,700 |
| | 1978 | 21,100 | 41,900 | 3,600 | 3,100 | | 69,700 |
| | % change | -14 | + 7 | NC | -11 | | - 1 |
| Other mergansers | 1977 | 10,200 | 10,700 | 2,000 | 7,400 | 100 | 30,500 |
| | 1978 | 8,000 | 6,500 | 3,000 | 8,400 | 600 | 26,500 |
| | % change | -22 | -39 | +50 | +14 | +500 | -13 |
| Other ducks | 1977 | 900 | 1,400 | 1,400 | 900 | 500 | 5,100 |
| | 1978 | 400 | 2,000 | 1,600 | 1,600 | 2,000 | 7,700 |
| | % change | -56 | +43 | +14 | +78 | +300 | +51 |

Table C-5. Continued.

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|---------------------------|----------|-----------------|--------------------|----------------|----------------|---------|---------------------|
| Total retrieved duck kill | 1977 | 1,881,900 | 5,956,000 | 2,439,600 | 3,084,500 | 108,300 | 13,470,300 |
| | 1978 | 1,945,900 | 6,340,000 | 2,969,200 | 3,975,400 | 124,100 | 15,354,500 |
| | % change | + 3 | + 6 | +22 | +29 | +15 | +14 |
| Unretrieved duck kill | 1977 | 464,300 | 1,313,300 | 444,800 | 520,600 | 16,500 | 2,759,600 |
| | 1978 | 455,300 | 1,406,100 | 572,800 | 654,900 | 16,500 | 3,105,600 |
| | % change | - 2 | + 7 | +29 | +26 | NC | +13 |
| Total duck kill | 1977 | 2,346,200 | 7,269,300 | 2,884,400 | 3,605,100 | 124,800 | 16,229,900 |
| | 1978 | 2,401,200 | 7,746,100 | 3,542,000 | 4,630,300 | 140,600 | 18,460,200 |
| | % change | + 2 | + 7 | +23 | +28 | +13 | +14 |
| Retrieved coot kill | 1977 | 53,600 | 284,400 | 40,900 | 112,900 | 400 | 492,200 |
| | 1978 | 78,000 | 206,900 | 55,800 | 100,400 | 600 | 641,700 |
| | % change | +46 | +43 | +36 | -11 | +50 | +30 |
| Unretrieved coot kill | 1977 | 13,000 | 70,800 | 16,200 | 41,500 | 100 | 141,600 |
| | 1978 | 19,500 | 95,200 | 31,900 | 39,500 | 100 | 186,200 |
| | % change | +50 | +34 | +97 | - 5 | NC | +31 |
| Total coot kill | 1977 | 66,600 | 355,300 | 57,100 | 154,400 | 500 | 633,800 |
| | 1978 | 97,500 | 502,100 | 87,700 | 139,800 | 700 | 827,900 |
| | % change | +46 | +41 | +54 | - 9 | +40 | +31 |

Table C-6. Total retrieved (by species) and unretrieved goose kill in the United States during the 1977 and 1978 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters).

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|---------------------------|----------|------------------|--------------------|------------------|--------------------|--------------------|---------------------|
| Retrieved goose kill | | | | | | | |
| Canada goose ^a | 1977 | 466,100 | 357,600 | 158,900 | 185,200 | 10,700 | 1,178,500 |
| | 1978 | 327,000 | 425,900 | 200,800 | 252,900 | 9,100 | 1,215,700 |
| | % change | -30 | +19 | +26 | +37 | -15 | +3 |
| Snow goose | 1977 | 22,100 | 44,700 | 192,300 | 81,800 | 600 | 341,600 |
| | 1978 | 20,100 | 50,700 | 132,400 | 30,900 | 100 | 234,200 |
| | % change | -9 | +13 | -31 | -62 | -83 | -31 |
| Blue goose | 1977 | 300 | 82,100 | 114,000 | | | 196,400 |
| | 1978 | | 83,200 | 56,600 | | | 139,800 |
| | % change | -100 | +1 | -50 | | | -29 |
| White-fronted goose | 1977 | | 18,700 | 49,200 | 34,400 | 1,200 | 103,400 |
| | 1978 | | 33,400 | 44,200 | 36,900 | 1,200 | 115,600 |
| | % change | | +79 | -10 | +7 | NC | +12 |
| Brant | 1977 | 600 ^b | | | 10,800 | 1,900 | 13,300 |
| | 1978 | 600 ^b | | | 1,500 | 800 | 2,800 |
| | % change | NC | | | -86 | -58 | -79 |
| Others and unknown | 1977 | | | 300 ^c | 4,200 ^c | 2,100 ^d | 6,600 |
| | 1978 | | | | 2,400 | 3,000 ^d | 5,400 |
| | % change | | | -100 | -43 | +43 | -18 |

Table C-6. Continued.

| Species | Season | Atlantic Flyway | Mississippi Flyway | Central Flyway | Pacific Flyway | Alaska | United States total |
|----------------------|----------|-----------------|--------------------|----------------|----------------|--------|---------------------|
| Total retrieved kill | 1977 | 489,100 | 503,100 | 514,600 | 316,500 | 16,500 | 1,839,800 |
| | 1978 | 347,600 | 593,200 | 434,000 | 324,500 | 14,100 | 1,713,400 |
| | % change | -29 | +18 | -16 | + 3 | -15 | - 7 |
| Unretrieved kill | 1977 | 74,900 | 84,600 | 68,900 | 43,200 | 2,600 | 274,100 |
| | 1978 | 52,200 | 110,100 | 58,700 | 47,000 | 1,800 | 269,800 |
| | % change | -30 | +30 | -15 | + 9 | -31 | - 2 |
| Total goose kill | 1977 | 564,000 | 587,700 | 583,500 | 359,700 | 19,100 | 2,113,900 |
| | 1978 | 399,900 | 703,300 | 492,700 | 371,600 | 15,900 | 1,983,300 |
| | % change | -29 | +20 | -16 | + 3 | -17 | - 6 |

^aIncludes all subspecies

^bBrant season in Atlantic Flyway closed in 1977 and 1978.

^cRoss' goose.

^dEmperor goose.

TABLE C-7--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE ATLANTIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS.

| | CONNECTICUT | | DELAWARE | | FLORIDA | | GEORGIA | |
|--|-------------|--------|----------|--------|---------|---------|---------|--------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 32.12% | 32.34% | 41.75% | 30.00% | 2.77% | 2.29% | 20.77% | 19.79% |
| DOMESTIC MALLARD | 0.36 | 0.73 | 1.54 | 1.53 | 0.00 | 0.12 | 0.20 | 0.00 |
| BLACK DUCK | 20.56 | 23.42 | 16.51 | 19.04 | 0.67 | 0.11 | 1.60 | 4.15 |
| BLACK X MALLARD | 2.49 | 1.45 | 0.65 | 1.91 | 0.09 | 0.05 | 0.51 | 0.38 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 4.56 | 6.00 | 0.00 | 0.00 |
| GADWALL | 0.36 | 0.24 | 0.00 | 2.67 | 0.76 | 1.23 | 0.30 | 3.70 |
| AMERICAN WIGEON | 0.48 | 1.14 | 5.77 | 0.38 | 4.82 | 4.66 | 0.20 | 2.20 |
| GREEN-WINGED TEAL | 10.13 | 6.77 | 7.81 | 29.91 | 4.68 | 7.22 | 2.58 | 5.98 |
| BLUE-WINGED/CINNAMON TEAL | 0.18 | 0.00 | 0.23 | 0.00 | 11.41 | 15.92 | 0.10 | 0.24 |
| NORTHERN SHOVELER | 0.00 | 0.00 | 0.00 | 1.53 | 1.63 | 1.84 | 0.00 | 1.15 |
| PINTAIL | 1.07 | 0.00 | 3.62 | 2.08 | 7.87 | 3.24 | 0.10 | 1.14 |
| WOOD DUCK | 9.91 | 8.30 | 3.58 | 1.91 | 9.34 | 10.79 | 62.12 | 56.03 |
| REDHEAD | 0.00 | 0.00 | 0.33 | 0.00 | 1.02 | 1.93 | 0.00 | 0.16 |
| CANVASBACK | 0.00 | 0.81 | 0.65 | 1.53 | 0.61 | 0.29 | 0.31 | 0.26 |
| GREATER SCAUP | 6.85 | 9.19 | 1.63 | 0.38 | 1.83 | 0.79 | 0.82 | 0.15 |
| LESSER SCAUP | 6.89 | 0.73 | 7.81 | 0.38 | 20.90 | 8.85 | 5.18 | 0.72 |
| RING-NECKED DUCK | 0.53 | 0.00 | 0.00 | 0.38 | 22.66 | 30.61 | 2.81 | 2.92 |
| GOLDENEYES | 0.36 | 2.66 | 0.65 | 0.76 | 0.00 | 0.08 | 1.67 | 0.00 |
| BUFFLEHEAD | 2.26 | 5.89 | 3.58 | 1.91 | 1.37 | 0.83 | 0.00 | 0.70 |
| RUDDY DUCK | 0.18 | 0.00 | 0.00 | 0.28 | 0.05 | 0.82 | 0.00 | 0.00 |
| OLDSQUAW | 0.80 | 0.00 | 0.33 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 9.01 | 4.54 | 2.61 | 3.05 | 0.15 | 0.00 | 0.00 | 0.00 |
| HOODED MERGANSERS | 0.53 | 1.30 | 0.33 | 0.00 | 1.99 | 1.72 | 0.73 | 0.33 |
| OTHER MERGANSERS | 0.54 | 0.48 | 0.33 | 0.38 | 0.36 | 0.38 | 0.00 | 0.00 |
| OTHER DUCKS | 0.00 | 0.00 | 0.00 | 0.00 | 0.18 | 0.04 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 51,091 | 33,064 | 38,976 | 53,340 | 256,075 | 305,230 | 83,614 | 74,582 |
| PERCENT CHANGE | | -35% | | +37% | | +19% | | -11% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 3.59 | 2.42 | 3.19 | 4.82 | 9.50 | 10.85 | 6.54 | 5.82 |
| PERCENT CHANGE | | -33% | | +51% | | +14% | | -11% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---------------------|--------|---------|--------|--------|---------|-------|-------|-------|
| CANADA GOOSE | 56.43% | 100.00% | 99.01% | 97.50% | 100.00% | 0.00% | 0.00% | 0.00% |
| SNOW GOOSE | 3.57 | 0.00 | 0.99 | 2.50 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 0.00 | 0.00 | 0.00 |

| | | | | | | | | |
|---|--------|--------|---------|---------|---------|---------|--------|--------|
| GOOSE HARVEST (RETRIEVED KILL) | 3,847 | 6,817 | 49,716 | 35,216 | 56 | 0 | 0 | 0 |
| PERCENT CHANGE | | +77% | | -29% | | -100% | | 0 |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.43 | 0.48 | 4.49 | 3.32 | 0.12 | 0.09 | 0.20 | 0.11 |
| PERCENT CHANGE | | +12% | | -26% | | -21% | | -48% |
| COOT HARVEST (RETRIEVED KILL) | 256 | 413 | 352 | 287 | 15,213 | 26,445 | 2,147 | 3,602 |
| PERCENT CHANGE | | +61% | | -18% | | +74% | | +68% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.02 | 0.03 | 0.03 | 0.02 | 0.54 | 0.88 | 0.15 | 0.23 |
| PERCENT CHANGE | | +47% | | -15% | | +61% | | +55% |
| TOTAL HUNTER DAYS | 87,827 | 94,961 | 112,990 | 118,579 | 164,707 | 191,708 | 81,615 | 85,387 |
| PERCENT CHANGE | | +8% | | +5% | | +16% | | +5% |
| DAYS PER ADULT HUNTER | 6.04 | 5.86 | 8.61 | 9.39 | 6.06 | 6.54 | 5.80 | 5.62 |
| PERCENT CHANGE | | -3% | | +9% | | +8% | | -3% |
| TOTAL DUCK STAMPS SOLD | 15,023 | 16,539 | 12,661 | 12,779 | 27,144 | 28,814 | 13,800 | 14,792 |
| PERCENT CHANGE | | +10% | | +1% | | +6% | | +7% |
| PERCENT SOLD TO NON-HUNTERS | 7.93% | 6.90% | 1.45% | 5.99% | 4.75% | 3.29% | 3.00% | 2.29% |
| TOTAL ADULT HUNTERS (PCTENTIAL) | 13,832 | 15,398 | 12,477 | 12,014 | 25,855 | 27,866 | 13,386 | 14,453 |
| PERCENT CHANGE | | +11% | | -4% | | +8% | | +8% |
| PERCENT ACTIVE ADULT HUNTERS | 78.2% | 80.1% | 87.5% | 88.0% | 83.6% | 85.6% | 85.7% | 87.7% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 52.7% | 53.3% | 70.6% | 69.8% | 70.5% | 73.2% | 67.0% | 68.3% |

SAMPLE SIZES

| | | | | | | | | |
|----------------|-----|-----|-----|-----|-------|-------|-----|-----|
| DUCK WINGS | 543 | 386 | 306 | 268 | 2,246 | 2,270 | 510 | 819 |
| GOOSE TAILS | 27 | 38 | 490 | 321 | 1 | 0 | 0 | 0 |
| QUESTIONNAIRES | 307 | 378 | 382 | 370 | 1,323 | 1,289 | 634 | 686 |

TABLE C-7--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE ATLANTIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS--continued.

| | MAINE | | MARYLAND ^a | | MASSACHUSETTS | | NEW HAMPSHIRE | |
|--|---------------|---------------|-----------------------|---------------|---------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 5.28% | 7.02% | 34.08% | 40.18% | 15.93% | 12.06% | 14.71% | 9.92% |
| DOMESTIC MALLARD | 0.24 | 0.32 | 1.24 | 1.16 | 0.52 | 0.39 | 0.00 | 0.00 |
| BLACK DUCK | 25.50 | 30.92 | 14.51 | 22.48 | 27.08 | 34.04 | 24.65 | 25.65 |
| BLACK X MALLARD | 0.66 | 0.65 | 0.44 | 0.75 | 0.62 | 1.24 | 0.00 | 1.33 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 0.00 | 0.00 | 3.07 | 1.78 | 0.80 | 0.00 | 0.00 | 0.00 |
| AMERICAN WIGEON | 1.08 | 0.37 | 2.51 | 3.78 | 1.91 | 2.66 | 0.00 | 0.33 |
| GREEN-WINGED TEAL | 12.75 | 12.73 | 2.33 | 10.86 | 4.47 | 5.59 | 5.15 | 7.82 |
| BLUE-WINGED/CINNAMON TEAL | 0.90 | 4.12 | 0.29 | 1.33 | 1.62 | 0.26 | 1.20 | 3.72 |
| NORTHERN SHOVELER | 0.00 | 0.00 | 0.29 | 1.05 | 0.20 | 0.00 | 0.00 | 0.00 |
| PINTAIL | 1.00 | 0.44 | 2.63 | 2.30 | 0.69 | 0.13 | 0.00 | 0.33 |
| WOOD DUCK | 12.39 | 11.53 | 0.66 | 4.80 | 10.60 | 7.84 | 31.76 | 33.90 |
| REDHEAD | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.26 | 0.00 | 0.00 |
| CANVASBACK | 0.00 | 0.00 | 0.00 | 0.00 | 0.30 | 1.33 | 0.00 | 0.00 |
| GREATER SCAUP | 0.00 | 0.00 | 1.90 | 0.33 | 2.20 | 2.45 | 0.00 | 0.00 |
| LESSER SCAUP | 0.52 | 0.16 | 20.58 | 0.08 | 0.60 | 0.13 | 0.49 | 0.00 |
| RING-NECKED DUCK | 4.01 | 2.60 | 0.07 | 0.33 | 0.76 | 0.54 | 3.89 | 0.33 |
| GOLDENEYES | 4.61 | 3.10 | 0.50 | 2.41 | 1.91 | 0.56 | 0.39 | 0.00 |
| BUFFLEHEAD | 9.10 | 8.10 | 3.00 | 3.36 | 7.09 | 5.21 | 0.13 | 1.67 |
| RUDDY DUCK | 0.31 | 0.00 | 0.68 | 0.33 | 0.10 | 0.00 | 0.49 | 0.39 |
| OLDSQUAW | 1.42 | 1.29 | 4.24 | 1.74 | 0.22 | 1.12 | 0.94 | 0.20 |
| EIDERS | 11.74 | 8.05 | 0.00 | 0.00 | 6.89 | 8.93 | 1.39 | 2.20 |
| SCOTERS | 5.55 | 6.30 | 5.99 | 0.96 | 13.89 | 13.11 | 11.16 | 7.21 |
| HOODED MERGANSERS | 1.38 | 1.31 | 0.58 | 0.00 | 0.16 | 0.44 | 1.14 | 1.67 |
| OTHER MERGANSERS | 1.47 | 0.98 | 0.00 | 0.00 | 0.93 | 1.32 | 2.52 | 3.33 |
| OTHER DUCKS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 76,909 | 86,178 | 77,685 | 176,808 | 72,283 | 90,291 | 31,510 | 30,128 |
| PERCENT CHANGE | | +12% | | +128% | | +25% | | -4% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 3.87 | 4.08 | 1.79 | 3.75 | 3.62 | 4.48 | 3.20 | 2.87 |
| PERCENT CHANGE | | +5% | | +110% | | +24% | | -10% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---------------------|---------|---------|--------|---------|--------|--------|---------|---------|
| CANADA GOOSE | 100.00% | 100.00% | 99.16% | 100.00% | 99.15% | 98.64% | 100.00% | 100.00% |
| SNOW GOOSE | 0.00 | 0.00 | 0.84 | 0.00 | 0.85 | 0.00 | 0.00 | 0.00 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.36 | 0.00 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

| | | | | | | | | |
|--------------------------------|-----|-------|---------|---------|-------|-------|-------|-------|
| GOOSE HARVEST (RETRIEVED KILL) | 947 | 2,998 | 294,789 | 158,649 | 6,688 | 6,757 | 1,242 | 1,945 |
| PERCENT CHANGE | | +217% | | -46% | | +1% | | +57% |

| | | | | | | | | |
|---|------|------|------|------|------|------|------|------|
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.11 | 0.15 | 5.82 | 2.86 | 0.32 | 0.33 | 0.14 | 0.19 |
| PERCENT CHANGE | | +45% | | -51% | | +3% | | +33% |

| | | | | | | | | |
|-------------------------------|-------|-------|-------|-------|-------|-------|----|--------|
| COOT HARVEST (RETRIEVED KILL) | 1,412 | 1,520 | 1,322 | 1,533 | 1,128 | 1,810 | 50 | 859 |
| PERCENT CHANGE | | +8% | | +16% | | +60% | | +1618% |

| | | | | | | | | |
|--|------|------|------|------|------|------|------|--------|
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.08 | 0.08 | 0.03 | 0.03 | 0.05 | 0.08 | 0.01 | 0.08 |
| PERCENT CHANGE | | +1% | | +10% | | +62% | | +1429% |

| | | | | | | | | |
|-------------------|--------|---------|---------|---------|---------|---------|--------|--------|
| TOTAL HUNTER DAYS | 93,945 | 108,693 | 338,116 | 382,899 | 150,510 | 152,599 | 69,991 | 62,928 |
| PERCENT CHANGE | | +16% | | +13% | | +1% | | -10% |

| | | | | | | | | |
|-----------------------|------|------|------|------|------|------|------|------|
| DAYS PER ADULT HUNTER | 5.12 | 5.63 | 7.94 | 8.38 | 6.93 | 7.07 | 6.52 | 5.89 |
| PERCENT CHANGE | | +10% | | +5% | | +2% | | -10% |

| | | | | | | | | |
|------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| TOTAL DUCK STAMPS SOLD | 17,664 | 18,650 | 39,921 | 43,333 | 22,070 | 21,875 | 10,483 | 10,577 |
| PERCENT CHANGE | | +6% | | +9% | | -1% | | +1% |

| | | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT SOLD TO NON-HUNTERS | 1.23% | 1.62% | 3.85% | 4.63% | 6.44% | 6.20% | 2.61% | 3.90% |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|

| | | | | | | | | |
|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|
| TOTAL ADULT HUNTERS (POTENTIAL) | 17,447 | 18,348 | 40,490 | 43,466 | 20,649 | 20,519 | 10,209 | 10,164 |
| PERCENT CHANGE | | +5% | | +7% | | -1% | | 0% |

| | | | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT ACTIVE ADULT HUNTERS | 83.0% | 84.5% | 87.3% | 88.3% | 83.2% | 83.8% | 83.4% | 84.0% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 60.7% | 63.7% | 72.0% | 67.1% | 56.7% | 62.4% | 57.4% | 57.9% |

SAMPLE SIZES

| | | | | | | | | |
|----------------|-------|-------|-------|-----|-------|-----|-----|-----|
| DUCK WINGS | 1,056 | 1,047 | 547 | 410 | 1,094 | 695 | 280 | 368 |
| GOOSE TAILS | 7 | 24 | 1,708 | 879 | 116 | 70 | 4 | 3 |
| QUESTIONNAIRES | 661 | 632 | 697 | 828 | 491 | 653 | 245 | 218 |

TABLE C-7-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE ATLANTIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS--continued.

| | NEW JERSEY | | NEW YORK | | NORTH CAROLINA ^a | | PENNSYLVANIA | |
|--|------------|---------|----------|---------|-----------------------------|---------|--------------|---------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 19.80% | 22.32% | 29.38% | 31.73% | 11.31% | 15.18% | 44.63% | 44.21% |
| DOMESTIC MALLARD | 0.82 | 0.21 | 0.08 | 0.39 | 0.21 | 0.00 | 1.82 | 0.84 |
| BLACK DUCK | 21.27 | 29.01 | 12.45 | 15.80 | 4.50 | 4.14 | 7.54 | 6.08 |
| BLACK X MALLARD | 1.17 | 2.54 | 1.05 | 0.91 | 0.05 | 0.28 | 0.86 | 0.61 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 2.27 | 2.09 | 1.68 | 1.26 | 2.16 | 3.72 | 0.35 | 1.88 |
| AMERICAN WIGEON | 2.41 | 3.68 | 3.33 | 4.50 | 7.46 | 8.55 | 1.98 | 1.66 |
| GREEN-WINGED TEAL | 13.91 | 13.53 | 5.25 | 5.80 | 4.84 | 7.44 | 3.97 | 4.27 |
| BLUE-WINGED/CINNAMON TEAL | 0.75 | 2.39 | 1.61 | 3.94 | 1.58 | 1.41 | 1.26 | 2.26 |
| NORTHERN SHOVELER | 0.69 | 0.16 | 0.45 | 0.32 | 0.43 | 0.48 | 0.17 | 0.33 |
| PINTAIL | 3.34 | 4.31 | 1.27 | 1.07 | 3.33 | 2.56 | 1.04 | 0.37 |
| WOOD DUCK | 8.46 | 6.17 | 11.92 | 18.30 | 23.46 | 46.88 | 21.32 | 26.55 |
| REDHEAD | 0.08 | 0.00 | 1.65 | 0.27 | 0.03 | 0.29 | 0.25 | 0.27 |
| CANVASBACK | 0.34 | 0.44 | 0.22 | 0.08 | 0.00 | 0.00 | 0.71 | 0.47 |
| GREATER SCAUP | 7.42 | 1.36 | 10.30 | 4.38 | 3.36 | 0.14 | 1.58 | 1.70 |
| LESSER SCAUP | 4.60 | 1.24 | 3.91 | 1.05 | 23.45 | 1.80 | 5.22 | 0.94 |
| RING-NECKED DUCK | 0.34 | 0.48 | 2.15 | 0.82 | 3.22 | 2.19 | 1.05 | 1.35 |
| GOLDENEYES | 0.65 | 0.53 | 2.52 | 3.18 | 0.34 | 0.57 | 0.42 | 0.94 |
| BUFFLEHEAD | 9.07 | 5.98 | 3.94 | 2.11 | 4.16 | 1.86 | 3.39 | 1.90 |
| RUDDY DUCK | 0.00 | 0.32 | 0.18 | 0.04 | 1.11 | 0.32 | 0.17 | 1.03 |
| OLDSQUAW | 0.17 | 0.30 | 0.31 | 0.36 | 0.06 | 0.00 | 0.50 | 0.23 |
| EIDERS | 0.00 | 0.00 | 0.03 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.67 | 0.32 | 3.56 | 2.65 | 2.05 | 0.90 | 1.26 | 0.53 |
| HOODED Mergansers | 1.77 | 2.25 | 0.61 | 0.49 | 2.42 | 0.56 | 0.44 | 1.14 |
| OTHER Mergansers | 0.00 | 0.37 | 1.56 | 0.50 | 0.43 | 0.15 | 0.08 | 0.44 |
| OTHER DUCKS | 0.00 | 0.00 | 0.11 | 0.04 | 0.00 | 0.14 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 136,168 | 128,903 | 247,700 | 264,415 | 276,337 | 173,132 | 165,299 | 148,660 |
| PERCENT CHANGE | | -5% | | +7% | | -37% | | -10% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 4.43 | 4.07 | 3.40 | 3.27 | 8.92 | 6.18 | 2.21 | 2.02 |
| PERCENT CHANGE | | -8% | | -4% | | -31% | | -9% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 54.97% | 45.24% | 99.09% | 98.38% | 57.22% | 45.44% | 99.00% | 100.00% |
| SNOW GOOSE | 45.03 | 54.76 | 0.91 | 0.81 | 42.05 | 54.56 | 0.50 | 0.00 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.81 | 0.73 | 0.00 | 0.00 | 0.00 |
| OTHER GESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 20,782 | 21,487 | 37,849 | 56,927 | 17,714 | 10,804 | 37,110 | 32,576 |
| PERCENT CHANGE | | +3% | | +50% | | -39% | | -12% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 1.00 | 0.81 | 0.53 | 0.71 | 0.54 | 0.34 | 0.56 | 0.48 |
| PERCENT CHANGE | | -19% | | +36% | | -36% | | -15% |
| COOT HARVEST (RETRIEVED KILL) | 661 | 2,355 | 1,972 | 4,173 | 13,910 | 12,327 | 5,217 | 7,432 |
| PERCENT CHANGE | | +256% | | +112% | | -11% | | +42% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.02 | 0.07 | 0.03 | 0.05 | 0.44 | 0.40 | 0.07 | 0.05 |
| PERCENT CHANGE | | +252% | | +96% | | -9% | | +40% |
| TOTAL HUNTER DAYS | 194,309 | 207,497 | 443,953 | 493,751 | 213,490 | 214,815 | 406,486 | 425,187 |
| PERCENT CHANGE | | +7% | | +11% | | +1% | | +5% |
| DAYS PER ADULT HUNTER | 6.24 | 6.69 | 5.74 | 6.02 | 6.98 | 7.23 | 5.37 | 5.56 |
| PERCENT CHANGE | | +7% | | +5% | | +4% | | +4% |
| TOTAL DUCK STAMPS SOLD | 31,550 | 31,597 | 79,293 | 83,388 | 29,545 | 29,050 | 74,213 | 76,154 |
| PERCENT CHANGE | | 0% | | +5% | | -2% | | +3% |
| PERCENT SOLD TO NON-HUNTERS | 6.21% | 6.69% | 7.26% | 6.47% | 2.03% | 3.25% | 2.96% | 4.58% |
| TOTAL ADULT HUNTERS (POTENTIAL) | 29,591 | 29,483 | 73,536 | 77,993 | 29,090 | 28,253 | 72,016 | 72,666 |
| PERCENT CHANGE | | 0% | | +6% | | -3% | | +1% |
| PERCENT ACTIVE ADULT HUNTERS | 86.2% | 83.7% | 80.7% | 80.4% | 88.0% | 88.3% | 86.5% | 85.8% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 61.7% | 65.1% | 56.1% | 57.5% | 73.4% | 71.2% | 57.3% | 53.8% |
| <u>SAMPLE SIZES</u> | | | | | | | | |
| DUCK WINGS | 1,194 | 853 | 1,755 | 2,067 | 1,595 | 777 | 1,005 | 881 |
| GOOSE TAILS | 151 | 180 | 223 | 370 | 120 | 90 | 205 | 138 |
| QUESTIONNAIRES | 484 | 594 | 1,242 | 1,943 | 870 | 920 | 1,078 | 1,287 |

TABLE C-7-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE ATLANTIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS--continued.

| | RHODE ISLAND | | SCUTH CARCLINA | | VERMONT | | VIRGINIA ^a | |
|--|---------------|---------------|----------------|---------------|---------------|---------------|-----------------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 7.40% | 17.08% | 21.08% | 22.55% | 24.28% | 28.37% | 24.24% | 30.13% |
| DOMESTIC MALLARD | 0.41 | 1.13 | 0.18 | 0.12 | 0.00 | 0.81 | 0.33 | 0.08 |
| BLACK DUCK | 23.76 | 34.59 | 3.23 | 3.97 | 26.00 | 18.62 | 8.32 | 14.18 |
| BLACK X MALLARD | 1.36 | 3.82 | 0.26 | 0.39 | 0.70 | 1.10 | 0.28 | 1.00 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 0.82 | 0.80 | 4.27 | 3.45 | 0.00 | 0.51 | 5.20 | 5.40 |
| AMERICAN WIGEON | 1.29 | 1.17 | 5.62 | 4.42 | 1.12 | 0.44 | 6.65 | 6.33 |
| GREEN-WINGED TEAL | 7.79 | 1.55 | 8.79 | 6.15 | 12.90 | 12.91 | 5.18 | 5.18 |
| BLUE-WINGED/CINNAMON TEAL | 0.41 | 1.51 | 1.18 | 3.14 | 2.24 | 5.27 | 1.17 | 3.93 |
| NORTHERN SHOVELER | 0.00 | 0.00 | 0.73 | 1.49 | 0.00 | 0.00 | 0.61 | 0.17 |
| PINTAIL | 0.21 | 0.76 | 1.44 | 1.89 | 1.60 | 0.51 | 2.60 | 1.51 |
| WOOD DUCK | 4.52 | 6.04 | 31.43 | 43.46 | 20.22 | 24.63 | 20.63 | 17.10 |
| REDHEAD | 0.00 | 0.76 | 0.41 | 0.19 | 0.00 | 0.00 | 0.00 | 0.08 |
| CANVASBACK | 0.41 | 1.37 | 1.32 | 0.19 | 0.00 | 0.00 | 0.07 | 0.00 |
| GREATER SCAUP | 31.37 | 12.32 | 1.02 | 0.38 | 0.28 | 0.58 | 0.80 | 0.42 |
| LESSER SCAUP | 4.73 | 2.40 | 9.48 | 0.62 | 0.00 | 0.74 | 10.42 | 0.33 |
| RING-NECKED DUCK | 0.00 | 0.38 | 6.29 | 5.64 | 4.43 | 0.22 | 4.23 | 5.94 |
| GOLDENEYES | 3.06 | 3.02 | 0.26 | 0.30 | 0.45 | 0.58 | 1.94 | 1.32 |
| BUFFLEHEAD | 2.26 | 4.65 | 1.73 | 0.41 | 0.00 | 1.39 | 3.76 | 3.72 |
| RUDDY DUCK | 0.00 | 0.00 | 0.38 | 0.08 | 0.22 | 0.00 | 0.21 | 0.68 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.73 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 7.13 | 3.09 | 0.00 | 0.00 | 2.44 | 0.66 | 0.41 | 0.08 |
| HOODED MERGANSERS | 1.37 | 0.84 | 0.91 | 1.15 | 2.89 | 2.35 | 1.71 | 2.34 |
| OTHER MERGANSERS | 1.70 | 2.73 | 0.00 | 0.00 | 0.00 | 0.27 | 0.50 | 0.08 |
| OTHER DUCKS | 0.00 | 0.00 | 0.50 | 0.00 | 0.22 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 26,879 | 19,107 | 173,635 | 186,871 | 32,878 | 36,571 | 129,403 | 129,574 |
| PERCENT CHANGE | | -29% | | +8% | | +11% | | 0% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 7.73 | 5.03 | 7.06 | 7.34 | 3.83 | 4.17 | 5.95 | 5.86 |
| PERCENT CHANGE | | -35% | | +4% | | +5% | | -2% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---------------------|---------|---------|-------|---------|---------|--------|--------|--------|
| CANADA GOOSE | 100.00% | 100.00% | 0.00% | 100.00% | 100.00% | 97.26% | 83.60% | 86.60% |
| SNOW GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.74 | 12.03 | 13.40 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.09 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 3.28 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 0.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

| | | | | | | | | |
|--------------------------------|-------|-------|---|--------|-------|-------|--------|-------|
| GOOSE HARVEST (RETRIEVED KILL) | 1,422 | 2,076 | 0 | 305 | 3,051 | 3,907 | 13,515 | 7,048 |
| PERCENT CHANGE | | +46% | | 99930% | | +28% | | -48% |

| | | | | | | | | |
|---|------|------|------|------|------|------|------|------|
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.57 | 0.52 | 0.20 | 0.10 | 0.33 | 0.48 | 1.62 | 0.85 |
| PERCENT CHANGE | | -9% | | -50% | | +46% | | -48% |

| | | | | | | | | |
|-------------------------------|----|-------|-------|-------|-----|-------|-------|-------|
| COOT HARVEST (RETRIEVED KILL) | 84 | 519 | 7,576 | 9,462 | 171 | 783 | 1,963 | 4,011 |
| PERCENT CHANGE | | +518% | | +25% | | +356% | | +104% |

| | | | | | | | | |
|--|------|-------|------|------|------|-------|------|------|
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.03 | 0.15 | 0.31 | 0.38 | 0.02 | 0.09 | 0.09 | 0.17 |
| PERCENT CHANGE | | +481% | | +22% | | +335% | | +94% |

| | | | | | | | | |
|-------------------|--------|--------|---------|---------|--------|--------|---------|---------|
| TOTAL HUNTER DAYS | 26,919 | 29,949 | 172,735 | 180,212 | 45,872 | 51,385 | 131,550 | 146,811 |
| PERCENT CHANGE | | +11% | | +4% | | +12% | | +12% |

| | | | | | | | | |
|-----------------------|------|------|------|------|------|------|------|------|
| DAYS PER ADULT HUNTER | 8.55 | 9.01 | 7.33 | 7.48 | 5.55 | 5.85 | 5.93 | 6.29 |
| PERCENT CHANGE | | +5% | | +2% | | +5% | | +6% |

| | | | | | | | | |
|------------------------|-------|-------|--------|--------|-------|-------|--------|--------|
| TOTAL DUCK STAMPS SOLD | 3,112 | 3,338 | 22,637 | 23,665 | 8,155 | 8,600 | 21,460 | 22,331 |
| PERCENT CHANGE | | +7% | | +5% | | +5% | | +4% |

| | | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT SOLD TO NON-HUNTERS | 3.85% | 5.28% | 1.06% | 3.16% | 3.66% | 2.95% | 6.55% | 5.45% |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|

| | | | | | | | | |
|---------------------------------|-------|-------|--------|--------|-------|-------|--------|--------|
| TOTAL ADULT HUNTERS (POTENTIAL) | 2,992 | 3,162 | 22,397 | 22,921 | 7,857 | 8,346 | 21,109 | 22,185 |
| PERCENT CHANGE | | +6% | | +2% | | +6% | | +5% |

| | | | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT ACTIVE ADULT HUNTERS | 85.0% | 83.9% | 89.9% | 88.9% | 83.8% | 88.3% | 83.6% | 84.6% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 58.1% | 56.8% | 72.9% | 71.1% | 59.6% | 65.3% | 68.1% | 66.5% |

SAMPLE SIZES

| | | | | | | | | |
|----------------|-----|-----|-------|-------|-----|-----|-------|-------|
| DUCK WINGS | 439 | 243 | 1,361 | 1,264 | 381 | 364 | 1,334 | 1,179 |
| GOOSE TAILS | 57 | 40 | 0 | 0 | 21 | 37 | 91 | 76 |
| QUESTIONNAIRES | 204 | 224 | 719 | 679 | 377 | 310 | 682 | 913 |

TABLE C-7-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE ATLANTIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS--continued.

| | WEST VIRGINIA | | ATLANTIC FLYWAY TOTAL | |
|--|---------------|---------------|-----------------------|---------------|
| | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | |
| MALLARD | 28.98% | 37.69% | 20.62% | 22.73% |
| DOMESTIC MALLARD | 2.10 | 1.23 | 0.44 | 0.39 |
| BLACK DUCK | 5.67 | 16.81 | 10.36 | 13.48 |
| BLACK X MALLARD | 0.00 | 0.72 | 0.58 | 0.80 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.62 | 0.94 |
| GADWALL | 0.36 | 1.59 | 1.78 | 2.07 |
| AMERICAN WIGEON | 2.12 | 0.87 | 3.54 | 4.02 |
| GREEN-WINGED TEAL | 2.42 | 0.80 | 6.37 | 8.10 |
| BLUE-WINGED/CINNAMON TEAL | 1.74 | 5.72 | 2.55 | 4.58 |
| NORTHERN SHOVELER | 0.34 | 0.00 | 0.54 | 0.75 |
| PINTAIL | 0.00 | 0.36 | 2.69 | 1.84 |
| WOOD DUCK | 46.66 | 29.65 | 18.22 | 20.94 |
| REDHEAD | 0.00 | 0.80 | 0.45 | 0.44 |
| CANVASBACK | 0.00 | 0.00 | 0.27 | 0.28 |
| GREATER SCAUP | 0.34 | 0.36 | 3.80 | 1.47 |
| LESSER SCAUP | 1.04 | 0.36 | 10.57 | 2.04 |
| RING-NECKED DUCK | 0.00 | 0.00 | 5.30 | 6.49 |
| GOLDENEYES | 2.51 | 1.52 | 1.07 | 1.23 |
| BUFFLEHEAD | 0.70 | 1.16 | 3.63 | 2.60 |
| RUDDY DUCK | 0.34 | 0.00 | 0.32 | 0.36 |
| OLDSQUAW | 0.00 | 0.00 | 0.44 | 0.36 |
| EIDERS | 0.00 | 0.00 | 0.77 | 0.81 |
| SCOTERS | 0.34 | 0.00 | 2.67 | 1.80 |
| HOODED MERGANSERS | 0.34 | 0.36 | 1.21 | 1.08 |
| OTHER MERGANSERS | 0.00 | 0.00 | 0.54 | 0.41 |
| OTHER DUCKS | 0.00 | 0.00 | 0.05 | 0.02 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 5,459 | 9,032 | 1,881,901 | 1,945,890 |
| PERCENT CHANGE | | +65% | | +3% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 2.19 | 3.89 | 4.36 | 4.41 |
| PERCENT CHANGE | | +78% | | +1% |

GOOSE SPECIES COMPOSITION

| | | | | |
|---|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 100.00% | 100.00% | 95.25% | 94.07% |
| SNOW GOOSE | 0.00 | 0.00 | 4.52 | 5.77 |
| BLUE GOOSE | 0.00 | 0.00 | 0.07 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.12 | 0.16 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 363 | 119 | 489,131 | 347,631 |
| PERCENT CHANGE | | -67% | | -29% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.36 | 0.09 | 1.16 | 0.79 |
| PERCENT CHANGE | | -74% | | -32% |
| COOT HARVEST (RETRIEVED KILL) | 157 | 464 | 53,591 | 77,999 |
| PERCENT CHANGE | | +196% | | +46% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.06 | 0.20 | 0.12 | 0.17 |
| PERCENT CHANGE | | +209% | | +41% |
| TOTAL HUNTER DAYS | 9,878 | 10,839 | 2,744,693 | 2,958,200 |
| PERCENT CHANGE | | +10% | | +8% |
| DAYS PER ADULT HUNTER | 4.14 | 4.76 | 6.29 | 6.55 |
| PERCENT CHANGE | | +15% | | +4% |
| TOTAL DUCK STAMPS SOLD | 2,358 | 2,354 | 434,557 | 451,319 |
| PERCENT CHANGE | | 0% | | +4% |
| PERCENT SOLD TO NON-HUNTERS | 3.89% | 8.06% | 4.46% | 4.86% |
| TOTAL ADULT HUNTERS (PCTENTIAL) | 2,266 | 2,164 | 415,159 | 429,401 |
| PERCENT CHANGE | | -5% | | +3% |
| PERCENT ACTIVE ADULT HUNTERS | 81.4% | 86.2% | 84.7% | 84.9% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 58.2% | 65.3% | 62.9% | 62.7% |
| <u>SAMPLE SIZES</u> | | | | |
| DUCK WINGS | 276 | 246 | 15,922 | 14,137 |
| GOOSE TAILS | 10 | 4 | 3,231 | 2,270 |
| QUESTIONNAIRES | 174 | 208 | 10,570 | 12,123 |

^aWashington, D. C. hunter activity allocated to Maryland, North Carolina, and Virginia.

TABLE C-8-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE MISSISSIPPI FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS.

| | ALABAMA | | ARKANSAS | | ILLINOIS | | INDIANA | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| <u>DUCK SPECIES COMPOSITION</u> | | | | | | | | |
| MALLARD | 25.96% | 25.27% | 68.33% | 68.73% | 50.63% | 47.05% | 52.32% | 39.14% |
| DOMESTIC MALLARD | 0.06 | 0.23 | 0.00 | 0.08 | 0.14 | 0.18 | 0.12 | 0.20 |
| BLACK DUCK | 3.84 | 2.96 | 0.68 | 0.59 | 1.28 | 1.30 | 3.45 | 5.61 |
| BLACK X MALLARD | 0.34 | 0.05 | 0.09 | 0.04 | 0.25 | 0.12 | 0.30 | 0.20 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 7.32 | 8.08 | 7.40 | 8.41 | 5.99 | 4.38 | 1.45 | 5.39 |
| AMERICAN WIGEON | 3.35 | 4.22 | 2.62 | 1.62 | 4.01 | 4.06 | 2.74 | 4.12 |
| GREEN-WINGED TEAL | 7.45 | 7.25 | 5.62 | 5.05 | 7.07 | 8.28 | 6.36 | 9.09 |
| BLUE-WINGED/CINNAMON TEAL | 2.80 | 3.66 | 0.81 | 1.21 | 4.13 | 5.28 | 5.19 | 6.70 |
| NORTHERN SHOVELER | 1.43 | 0.74 | 0.97 | 0.71 | 0.81 | 0.66 | 0.37 | 0.30 |
| PINTAIL | 1.86 | 3.89 | 1.34 | 0.74 | 1.84 | 2.64 | 1.28 | 1.42 |
| WOOD DUCK | 25.40 | 35.54 | 5.43 | 9.41 | 10.24 | 13.61 | 12.62 | 17.19 |
| REDHEAD | 0.26 | 0.18 | 0.08 | 0.08 | 0.56 | 0.74 | 0.50 | 0.78 |
| CANVASBACK | 0.43 | 0.39 | 0.29 | 0.15 | 0.27 | 0.39 | 0.42 | 0.61 |
| GREATER SCAUP | 1.41 | 0.25 | 0.00 | 0.00 | 0.41 | 0.82 | 0.15 | 0.45 |
| LESSER SCAUP | 8.85 | 2.78 | 3.37 | 0.77 | 4.89 | 4.47 | 3.40 | 1.35 |
| RING-NECKED DUCK | 4.95 | 2.84 | 2.27 | 1.62 | 4.89 | 3.57 | 2.06 | 4.65 |
| GOLDENEYES | 1.07 | 0.47 | 0.00 | 0.00 | 0.73 | 0.82 | 3.20 | 1.11 |
| BUFFLEHEAD | 1.65 | 0.34 | 0.32 | 0.04 | 0.70 | 0.58 | 2.10 | 0.73 |
| RUDDY DUCK | 0.48 | 0.18 | 0.00 | 0.33 | 0.07 | 0.36 | 0.27 | 0.30 |
| DOWNSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.00 | 0.00 | 0.02 | 0.00 | 0.24 | 0.05 | 0.10 | 0.17 |
| HOODED MERGANSERS | 0.79 | 0.68 | 0.36 | 0.31 | 0.59 | 0.58 | 0.96 | 0.41 |
| OTHER MERGANSERS | 0.15 | 0.00 | 0.00 | 0.04 | 0.26 | 0.00 | 0.48 | 0.07 |
| OTHER DUCKS | 0.17 | 0.00 | 0.00 | 0.07 | 0.00 | 0.07 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| DUCK HARVEST (RETRIEVED KILL) | 135,809 | 118,375 | 852,776 | 698,338 | 347,082 | 441,236 | 72,383 | 72,004 |
| PERCENT CHANGE | | -15% | | -18% | | +27% | | -1% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 8.35 | 7.16 | 13.23 | 10.30 | 5.63 | 6.45 | 5.74 | 5.54 |
| PERCENT CHANGE | | -14% | | -22% | | +14% | | -3% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 66.67% | 100.00% | 35.37% | 29.31% | 99.45% | 98.57% | 100.00% | 100.00% |
| SNOW GOOSE | 11.11 | 0.00 | 39.30 | 26.72 | 0.55 | 0.48 | 0.00 | 0.00 |
| BLUE GOOSE | 22.22 | 0.00 | 25.32 | 36.64 | 0.00 | 0.95 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 7.33 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 1,108 | 3,413 | 5,843 | 13,935 | 76,986 | 120,423 | 3,693 | 2,305 |
| PERCENT CHANGE | | +208% | | +138% | | +56% | | -38% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.25 | 0.24 | 0.17 | 0.22 | 1.18 | 1.68 | 0.45 | 0.43 |
| PERCENT CHANGE | | -3% | | +24% | | +42% | | -6% |
| COOT HARVEST (RETRIEVED KILL) | 6,177 | 14,202 | 6,368 | 10,643 | 5,553 | 9,584 | 1,667 | 4,141 |
| PERCENT CHANGE | | +130% | | +67% | | +73% | | +148% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.35 | 0.84 | 0.11 | 0.18 | 0.08 | 0.14 | 0.11 | 0.26 |
| PERCENT CHANGE | | +137% | | +66% | | +69% | | +146% |
| TOTAL HUNTER DAYS | 129,001 | 124,568 | 552,543 | 477,483 | 630,538 | 681,058 | 107,323 | 123,836 |
| PERCENT CHANGE | | -3% | | -14% | | +8% | | +15% |
| DAYS PER ADULT HUNTER | 7.54 | 7.49 | 9.48 | 8.12 | 9.26 | 5.80 | 6.93 | 7.95 |
| PERCENT CHANGE | | -1% | | -14% | | +6% | | +15% |
| TOTAL DUCK STAMPS SOLD | 16,437 | 16,072 | 54,919 | 56,892 | 66,065 | 67,805 | 15,215 | 15,364 |
| PERCENT CHANGE | | -2% | | +4% | | +3% | | +1% |
| PERCENT SOLD TO NON-HUNTERS | 2.70% | 3.29% | 0.76% | 3.38% | 3.67% | 4.18% | 4.88% | 5.29% |
| TOTAL ADULT HUNTERS (PCTENTIAL) | 15,993 | 15,543 | 54,502 | 54,969 | 63,640 | 64,971 | 14,473 | 14,551 |
| PERCENT CHANGE | | -3% | | +1% | | +2% | | +1% |
| PERCENT ACTIVE ADULT HUNTERS | 83.7% | 86.9% | 85.9% | 85.7% | 86.6% | 88.0% | 85.2% | 87.2% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 72.6% | 69.4% | 74.9% | 73.1% | 70.0% | 72.4% | 68.4% | 69.8% |
| <u>SAMPLE SIZES</u> | | | | | | | | |
| DUCK WINGS | 1,376 | 1,080 | 1,605 | 1,942 | 1,375 | 1,547 | 1,215 | 1,096 |
| GOOSE TAILS | 9 | 16 | 9 | 13 | 204 | 218 | 31 | 14 |
| QUESTIONNAIRES | 783 | 773 | 660 | 906 | 860 | 1,156 | 372 | 643 |

TABLE C-8-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE MISSISSIPPI FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS --continued.

| | IOWA | | KENTUCKY | | LOUISIANA | | MICHIGAN | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 49.54% | 35.75% | 61.61% | 53.74% | 16.60% | 17.91% | 41.86% | 47.92% |
| DOMESTIC MALLARD | 0.17 | 0.05 | 0.55 | 0.96 | 0.00 | 0.00 | 0.36 | 0.16 |
| BLACK DUCK | 0.13 | 0.07 | 10.67 | 10.92 | 0.11 | 0.25 | 5.44 | 5.72 |
| BLACK X MALLARD | 0.00 | 0.11 | 0.63 | 0.59 | 0.00 | 0.02 | 0.25 | 0.44 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 2.36 | 2.58 | 0.00 | 0.00 |
| GADWALL | 2.85 | 4.99 | 2.45 | 7.55 | 10.01 | 14.05 | 0.86 | 2.86 |
| AMERICAN WIGEON | 3.97 | 3.69 | 2.09 | 1.29 | 4.97 | 6.78 | 2.38 | 4.99 |
| GREEN-WINGED TEAL | 13.83 | 11.88 | 1.91 | 0.75 | 19.04 | 17.81 | 10.01 | 5.81 |
| BLUE-WINGED/CINNAMON TEAL | 6.07 | 11.69 | 0.75 | 1.05 | 13.64 | 13.27 | 2.02 | 3.86 |
| NORTHERN SHOVELER | 1.44 | 1.70 | 0.21 | 0.00 | 4.30 | 5.75 | 0.11 | 0.07 |
| PINTAIL | 2.73 | 2.62 | 2.31 | 0.93 | 7.69 | 6.66 | 2.60 | 1.58 |
| WOOD DUCK | 13.55 | 20.93 | 4.22 | 15.12 | 6.73 | 7.69 | 9.46 | 8.68 |
| REDHEAD | 0.45 | 0.69 | 0.00 | 1.07 | 0.14 | 0.23 | 0.63 | 1.49 |
| CANVASBACK | 0.33 | 0.19 | 1.18 | 0.59 | 0.39 | 0.21 | 0.65 | 0.18 |
| GREATER SCAUP | 0.09 | 0.15 | 0.57 | 0.86 | 0.12 | 0.16 | 3.60 | 1.51 |
| LESSER SCAUP | 1.51 | 1.61 | 3.36 | 0.16 | 9.69 | 2.76 | 6.33 | 3.31 |
| RING-NECKED DUCK | 1.26 | 2.09 | 4.50 | 0.16 | 2.49 | 2.67 | 3.54 | 3.98 |
| GOLDENEYES | 0.38 | 0.29 | 0.85 | 2.16 | 0.18 | 0.10 | 1.49 | 1.38 |
| BUFFLEHEAD | 0.26 | 0.52 | 0.47 | 0.00 | 0.10 | 0.10 | 3.10 | 3.03 |
| RUDDY DUCK | 0.10 | 0.00 | 0.00 | 0.00 | 0.31 | 0.43 | 0.34 | 0.51 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.10 | 0.04 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 |
| SCOTERS | 0.00 | 0.05 | 0.00 | 0.00 | 0.02 | 0.00 | 2.32 | 0.00 |
| HOODED MERGANSERS | 0.34 | 0.92 | 1.28 | 1.67 | 0.78 | 0.40 | 1.64 | 2.25 |
| OTHER MERGANSERS | 0.00 | 0.00 | 0.00 | 0.43 | 0.27 | 0.07 | 0.84 | 0.14 |
| OTHER DUCKS | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.06 | 0.05 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 279,965 | 351,358 | 74,784 | 64,287 | 1,937,748 | 2,010,363 | 255,687 | 290,044 |
| PERCENT CHANGE | | +26% | | -14% | | +4% | | +13% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 4.43 | 5.84 | 4.61 | 3.85 | 15.28 | 15.34 | 3.30 | 4.29 |
| PERCENT CHANGE | | +32% | | -16% | | 0% | | +30% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 20.69% | 32.68% | 98.51% | 100.00% | 1.83% | 0.00% | 96.73% | 100.00% |
| SNOW GOOSE | 36.39 | 29.51 | 0.00 | 0.00 | 18.31 | 25.30 | 0.00 | 0.00 |
| BLUE GOOSE | 40.41 | 36.01 | 1.45 | 0.00 | 58.87 | 47.15 | 3.27 | 0.00 |
| WHITE-FRONTED GOOSE | 2.52 | 1.81 | 0.00 | 0.00 | 20.99 | 27.51 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 37,934 | 36,488 | 19,131 | 23,417 | 80,950 | 115,209 | 32,837 | 23,305 |
| PERCENT CHANGE | | -4% | | +22% | | +42% | | -25% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.52 | 0.47 | 0.51 | 1.52 | 0.66 | 0.92 | 0.42 | 0.36 |
| PERCENT CHANGE | | -10% | | +67% | | +35% | | -16% |
| COOT HARVEST (RETRIEVED KILL) | 6,586 | 7,509 | 533 | 3,162 | 169,172 | 228,674 | 5,640 | 10,662 |
| PERCENT CHANGE | | +14% | | +493% | | +35% | | +89% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.11 | 0.13 | 0.03 | 0.18 | 1.28 | 1.70 | 0.07 | 0.16 |
| PERCENT CHANGE | | +16% | | +441% | | +32% | | +111% |
| TOTAL HUNTER DAYS | 435,846 | 454,666 | 113,454 | 117,977 | 1,068,246 | 1,073,380 | 443,131 | 407,546 |
| PERCENT CHANGE | | +4% | | +4% | | 0% | | -8% |
| DAYS PER ADULT HUNTER | 7.33 | 7.75 | 7.30 | 6.99 | 8.26 | 8.12 | 5.89 | 6.09 |
| PERCENT CHANGE | | +6% | | -4% | | -2% | | +3% |
| TOTAL DUCK STAMPS SOLD | 57,143 | 56,259 | 14,905 | 16,036 | 122,349 | 125,301 | 72,096 | 65,055 |
| PERCENT CHANGE | | -2% | | +8% | | +2% | | -10% |
| PERCENT SOLD TO NON-HUNTERS | 2.79% | 2.50% | 2.49% | 1.66% | 1.22% | 1.42% | 2.43% | 3.83% |
| TOTAL ADULT HUNTERS (PCTENTIAL) | 55,549 | 54,853 | 14,534 | 15,770 | 120,856 | 123,522 | 70,344 | 62,563 |
| PERCENT CHANGE | | -1% | | +9% | | +2% | | -11% |
| PERCENT ACTIVE ADULT HUNTERS | 83.2% | 87.1% | 85.0% | 82.3% | 85.8% | 85.1% | 84.4% | 84.5% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 64.6% | 72.7% | 63.8% | 61.4% | 78.0% | 77.3% | 58.4% | 65.9% |
| <u>SAMPLE SIZES</u> | | | | | | | | |
| DUCK WINGS | 1,447 | 1,552 | 529 | 294 | 4,279 | 3,866 | 1,565 | 1,653 |
| GOOSE TAILS | 197 | 170 | 92 | 63 | 58 | 76 | 102 | 97 |
| QUESTIONNAIRES | 682 | 939 | 465 | 570 | 1,787 | 1,629 | 724 | 1,044 |

TABLE C-8-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE MISSISSIPPI FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS --continued.

| | MINNESOTA | | MISSISSIPPI | | MISSOURI | | OHIO | |
|--|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 25.04% | 30.04% | 56.48% | 50.98% | 53.24% | 47.55% | 41.05% | 36.15% |
| DOMESTIC MALLARD | 0.13 | 0.09 | 0.09 | 0.15 | 0.00 | 0.00 | 0.56 | 0.12 |
| BLACK DUCK | 0.37 | 0.10 | 2.11 | 1.98 | 0.17 | 0.11 | 6.03 | 5.72 |
| BLACK X MALLARD | 0.00 | 0.02 | 0.08 | 0.08 | 0.00 | 0.00 | 0.45 | 0.50 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.17 | 0.16 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 2.88 | 2.77 | 6.11 | 5.11 | 7.30 | 7.09 | 1.13 | 1.57 |
| AMERICAN WIGEON | 6.77 | 5.61 | 2.58 | 4.36 | 5.94 | 3.20 | 3.52 | 2.90 |
| GREEN-WINGED TEAL | 10.45 | 6.86 | 5.67 | 7.87 | 9.41 | 8.32 | 5.38 | 6.76 |
| BLUE-WINGED/CINNAMON TEAL | 11.93 | 11.25 | 1.24 | 1.62 | 4.72 | 7.62 | 5.60 | 7.15 |
| NORTHERN SHOVELER | 1.28 | 2.67 | 0.87 | 1.57 | 1.63 | 1.21 | 0.55 | 0.99 |
| PINTAIL | 1.15 | 1.85 | 0.45 | 0.24 | 1.44 | 3.80 | 1.31 | 1.06 |
| WOOD DUCK | 12.87 | 12.23 | 12.74 | 19.09 | 7.86 | 8.03 | 22.53 | 23.12 |
| REDHEAD | 1.63 | 3.46 | 0.14 | 0.00 | 0.38 | 0.52 | 0.94 | 2.66 |
| CANVASBACK | 0.79 | 0.53 | 0.28 | 0.17 | 0.16 | 0.23 | 0.82 | 0.47 |
| GREATER SCAUP | 0.20 | 0.19 | 0.17 | 0.16 | 0.08 | 0.15 | 0.45 | 0.71 |
| LESSER SCAUP | 5.20 | 4.77 | 6.18 | 1.20 | 4.33 | 4.96 | 3.65 | 2.06 |
| RING-NECKED DUCK | 12.91 | 13.57 | 3.06 | 3.82 | 2.51 | 3.47 | 1.32 | 3.15 |
| GOLDENEYES | 0.32 | 0.85 | 0.16 | 0.00 | 0.19 | 0.51 | 0.27 | 1.06 |
| BUFFLEHEAD | 1.46 | 2.04 | 0.08 | 0.26 | 0.17 | 0.58 | 1.39 | 1.83 |
| RUDDY DUCK | 0.03 | 0.51 | 0.12 | 0.15 | 0.00 | 1.50 | 0.85 | 0.95 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.09 | 0.03 | 0.00 | 0.00 | 0.11 | 0.00 | 0.34 | 0.12 |
| HOODED Mergansers | 0.44 | 0.50 | 1.18 | 0.86 | 0.21 | 0.57 | 0.88 | 0.75 |
| OTHER Mergansers | 0.03 | 0.04 | 0.04 | 0.18 | 0.16 | 0.15 | 0.85 | 0.20 |
| OTHER DUCKS | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 664,871 | 1,012,331 | 330,183 | 227,836 | 269,486 | 253,854 | 106,653 | 102,153 |
| PERCENT CHANGE | | +52% | | -31% | | -6% | | -4% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 4.41 | 6.89 | 9.77 | 7.65 | 4.50 | 4.28 | 2.98 | 3.03 |
| PERCENT CHANGE | | +56% | | -22% | | -5% | | +2% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 81.66% | 94.08% | 85.72% | 100.00% | 76.91% | 85.83% | 98.91% | 100.00% |
| SNOW GOOSE | 4.85 | 0.66 | 7.14 | 0.00 | 12.70 | 7.27 | 1.09 | 0.00 |
| BLUE GOOSE | 11.87 | 5.26 | 7.14 | 0.00 | 10.39 | 6.90 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 1.62 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| GOOSE HARVEST (RETRIEVED KILL) | 44,195 | 57,009 | 3,273 | 3,902 | 84,552 | 79,542 | 12,652 | 10,716 |
| PERCENT CHANGE | | +29% | | +19% | | -6% | | -16% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.38 | 0.46 | 0.11 | 0.14 | 1.23 | 1.14 | 0.36 | 0.32 |
| PERCENT CHANGE | | +22% | | +33% | | -7% | | -11% |
| COOT HARVEST (RETRIEVED KILL) | 32,642 | 63,556 | 3,561 | 5,656 | 3,642 | 4,818 | 6,054 | 6,666 |
| PERCENT CHANGE | | +95% | | +59% | | +32% | | +9% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.20 | 0.38 | 0.11 | 0.19 | 0.05 | 0.07 | 0.15 | 0.17 |
| PERCENT CHANGE | | +90% | | +77% | | +35% | | +8% |
| TOTAL HUNTER DAYS | 1,028,405 | 1,160,152 | 224,599 | 199,963 | 460,465 | 443,872 | 252,906 | 246,445 |
| PERCENT CHANGE | | +13% | | -11% | | -4% | | -3% |
| DAYS PER ADULT HUNTER | 6.46 | 7.11 | 7.03 | 6.96 | 7.08 | 6.99 | 6.47 | 6.27 |
| PERCENT CHANGE | | +10% | | -1% | | -1% | | -3% |
| TOTAL DUCK STAMPS SOLD | 150,805 | 155,387 | 30,282 | 27,164 | 61,325 | 60,718 | 38,412 | 39,483 |
| PERCENT CHANGE | | +3% | | -10% | | -1% | | +3% |
| PERCENT SOLD TO NON-HUNTERS | 1.36% | 1.85% | 1.28% | 1.20% | 0.88% | 2.31% | 4.89% | 6.99% |
| TOTAL ADULT HUNTERS (POTENTIAL) | 148,754 | 152,512 | 29,894 | 26,838 | 60,785 | 59,315 | 36,524 | 36,723 |
| PERCENT CHANGE | | +3% | | -10% | | -2% | | +1% |
| PERCENT ACTIVE ADULT HUNTERS | 91.0% | 90.8% | 85.3% | 84.9% | 87.4% | 87.0% | 87.7% | 85.3% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 72.1% | 80.5% | 74.9% | 73.3% | 67.4% | 68.6% | 60.8% | 58.2% |
| SAMPLE SIZES | | | | | | | | |
| DUCK WINGS | 2,967 | 3,026 | 1,508 | 1,069 | 1,119 | 1,199 | 1,363 | 850 |
| GOOSE TAILS | 185 | 152 | 14 | 5 | 269 | 235 | 91 | 86 |
| QUESTIONNAIRES | 1,671 | 1,970 | 659 | 887 | 963 | 1,138 | 626 | 760 |

TABLE C-8-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE MISSISSIPPI FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS --continued.

| | TENNESSEE | | WISCONSIN | | MISSISSIPPI FLYWAY TOTAL | |
|--|---------------|---------------|---------------|---------------|--------------------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | |
| MALLARD | 58.87% | 57.25% | 36.23% | 34.14% | 38.11% | 35.60% |
| DOMESTIC MALLARD | 0.12 | 0.30 | 0.16 | 0.17 | 0.09 | 0.09 |
| BLACK DUCK | 5.11 | 5.84 | 1.57 | 1.43 | 1.33 | 1.18 |
| BLACK X MALLARD | 0.00 | 0.04 | 0.06 | 0.24 | 0.08 | 0.09 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.78 | 0.82 |
| GADWALL | 4.01 | 7.79 | 1.47 | 3.13 | 6.33 | 7.78 |
| AMERICAN WIGEON | 3.05 | 3.60 | 5.12 | 9.64 | 4.37 | 5.32 |
| GREEN-WINGED TEAL | 4.20 | 1.03 | 9.64 | 7.63 | 11.66 | 10.45 |
| BLUE-WINGED/CINNAMON TEAL | 3.29 | 3.75 | 10.22 | 13.59 | 7.93 | 9.22 |
| NORTHERN SHOVELER | 0.48 | 0.07 | 0.66 | 1.19 | 2.04 | 2.71 |
| PINTAIL | 1.68 | 2.11 | 2.09 | 1.23 | 3.59 | 3.32 |
| WOOD DUCK | 6.12 | 9.90 | 15.47 | 13.27 | 9.72 | 11.70 |
| REDHEAD | 0.13 | 0.28 | 1.16 | 1.17 | 0.47 | 1.00 |
| CANVASBACK | 0.00 | 0.34 | 0.39 | 0.29 | 0.42 | 0.32 |
| GREATER SCAUP | 0.78 | 0.48 | 1.49 | 0.66 | 0.45 | 0.33 |
| LESSER SCAUP | 2.17 | 0.67 | 4.06 | 1.92 | 6.12 | 2.80 |
| RING-NECKED DUCK | 4.89 | 1.67 | 6.87 | 6.61 | 4.26 | 4.78 |
| GOLDENEYES | 0.21 | 1.31 | 0.43 | 0.75 | 0.36 | 0.48 |
| BUFFLEHEAD | 0.00 | 1.50 | 2.23 | 1.36 | 0.72 | 0.80 |
| RUDDY DUCK | 0.00 | 0.04 | 0.17 | 0.10 | 0.18 | 0.40 |
| OLDSQUAW | 0.23 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.00 | 0.00 | 0.11 | 0.00 | 0.15 | 0.02 |
| HOODED MERGANSERS | 0.43 | 1.51 | 0.40 | 1.04 | 0.66 | 0.66 |
| OTHER MERGANSERS | 0.23 | 0.00 | 0.00 | 0.46 | 0.18 | 0.10 |
| OTHER DUCKS | 0.02 | 0.53 | 0.00 | 0.00 | 0.02 | 0.03 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 136,018 | 155,591 | 488,500 | 541,770 | 5,955,985 | 6,339,984 |
| PERCENT CHANGE | | +15% | | +11% | | +6% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 8.70 | 8.65 | 3.24 | 4.23 | 6.70 | 7.36 |
| PERCENT CHANGE | | 0% | | +31% | | +10% |

GOOSE SPECIES COMPOSITION

| | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 100.00% | 96.30% | 98.12% | 99.22% | 71.09% | 71.80% |
| SNOW GOOSE | 0.00 | 3.30 | 0.00 | 0.39 | 8.89 | 8.55 |
| BLUE GOOSE | 0.00 | 3.70 | 1.88 | 0.39 | 16.31 | 14.03 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 3.71 | 5.63 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| GOOSE HARVEST (RETRIEVED KILL) | 8,218 | 17,155 | 91,644 | 86,355 | 503,056 | 553,178 |
| PERCENT CHANGE | | +109% | | -6% | | +18% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.37 | 0.77 | 0.61 | 0.72 | 0.57 | 0.70 |
| PERCENT CHANGE | | +107% | | +19% | | +21% |
| COOT HARVEST (RETRIEVED KILL) | 5,779 | 4,888 | 31,032 | 32,780 | 284,446 | 406,941 |
| PERCENT CHANGE | | -15% | | +6% | | +43% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.18 | 0.16 | 0.21 | 0.26 | 0.31 | 0.45 |
| PERCENT CHANGE | | -14% | | +26% | | +47% |
| TOTAL HUNTER DAYS | 246,255 | 302,998 | 984,534 | 928,645 | 6,677,686 | 6,742,589 |
| PERCENT CHANGE | | +23% | | -6% | | +1% |
| DAYS PER ADULT HUNTER | 7.96 | 9.90 | 6.62 | 7.49 | 7.31 | 7.62 |
| PERCENT CHANGE | | +24% | | +13% | | +4% |
| TOTAL DUCK STAMPS SOLD | 29,575 | 29,213 | 142,536 | 118,107 | 872,064 | 848,856 |
| PERCENT CHANGE | | -1% | | -17% | | -3% |
| PERCENT SOLD TO NON-HUNTERS | 2.23% | 2.06% | 2.42% | 1.84% | 2.09% | 2.61% |
| TOTAL ADULT HUNTERS (POTENTIAL) | 28,515 | 28,611 | 139,087 | 115,934 | 853,860 | 826,675 |
| PERCENT CHANGE | | -1% | | -17% | | -3% |
| PERCENT ACTIVE ADULT HUNTERS | 88.7% | 87.5% | 87.9% | 89.7% | 87.0% | 87.4% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 72.3% | 73.4% | 69.6% | 73.1% | 70.0% | 73.1% |
| SAMPLE SIZES | | | | | | |
| DUCK WINGS | 536 | 778 | 1,912 | 2,317 | 22,796 | 22,269 |
| GOOSE TAILS | 14 | 27 | 317 | 254 | 1,592 | 1,426 |
| QUESTIONNAIRES | 681 | 500 | 1,216 | 1,263 | 12,149 | 14,178 |

TABLE C-9-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE CENTRAL FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS.

| | COLORADO ^a | | KANSAS | | MONTANA ^a | | NEBRASKA | |
|--|-----------------------|---------------|---------------|---------------|----------------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 48.16% | 58.06% | 40.97% | 48.38% | 73.38% | 69.20% | 56.18% | 59.62% |
| DOMESTIC MALLARD | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 |
| BLACK DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 4.98 | 6.18 | 7.48 | 8.06 | 5.82 | 6.36 | 5.12 | 5.55 |
| AMERICAN WIGEON | 9.28 | 7.82 | 6.53 | 4.79 | 7.94 | 5.83 | 7.10 | 5.24 |
| GREEN-WINGED TEAL | 19.82 | 9.75 | 19.06 | 15.50 | 5.11 | 4.01 | 18.72 | 13.38 |
| BLUE-WINGED/CINNAMON TEAL | 7.64 | 10.30 | 7.62 | 8.25 | 0.77 | 1.60 | 1.40 | 3.01 |
| NORTHERN SHOVELER | 2.62 | 2.56 | 2.11 | 1.38 | 1.32 | 2.28 | 1.94 | 2.23 |
| PINTAIL | 3.18 | 1.43 | 4.46 | 2.44 | 2.20 | 5.41 | 3.54 | 1.97 |
| WOOD DUCK | 0.00 | 0.28 | 3.70 | 1.48 | 0.53 | 0.34 | 2.02 | 2.55 |
| REDHEAD | 0.94 | 0.41 | 1.24 | 2.10 | 0.00 | 0.70 | 0.76 | 1.78 |
| CANVASBACK | 0.34 | 0.06 | 0.24 | 0.10 | 0.65 | 0.55 | 0.08 | 0.11 |
| GREATER SCAUP | 0.23 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.08 |
| LESSER SCAUP | 1.08 | 0.89 | 1.72 | 2.45 | 0.19 | 1.77 | 0.91 | 2.10 |
| RING-NECKED DUCK | 0.21 | 0.23 | 3.70 | 2.07 | 0.58 | 0.41 | 1.05 | 0.77 |
| GOLDENEYES | 0.44 | 1.17 | 0.29 | 0.48 | 0.37 | 1.50 | 0.19 | 0.42 |
| BUFFLEHEAD | 0.32 | 0.63 | 0.44 | 2.41 | 0.39 | 0.00 | 0.69 | 0.19 |
| RUDDY DUCK | 0.08 | 0.00 | 0.08 | 0.03 | 0.00 | 0.00 | 0.30 | 0.00 |
| OLDSQUAW | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.11 | 0.00 | 0.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| HOODED MERGANSERS | 0.00 | 0.00 | 0.05 | 0.00 | 0.19 | 0.00 | 0.00 | 0.16 |
| OTHER MERGANSERS | 0.46 | 0.23 | 0.04 | 0.00 | 0.56 | 0.00 | 0.00 | 0.58 |
| OTHER DUCKS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 118,253 | 133,520 | 368,509 | 267,477 | 34,309 | 43,285 | 257,670 | 309,365 |
| PERCENT CHANGE | | +13% | | -27% | | +26% | | +20% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 2.62 | 3.41 | 6.00 | 4.67 | 4.00 | 4.21 | 5.93 | 7.18 |
| PERCENT CHANGE | | +30% | | -22% | | +5% | | +21% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 100.00% | 98.10% | 61.39% | 77.51% | 100.00% | 84.72% | 59.79% | 62.64% |
| SNOW GOOSE | 0.00 | 1.03 | 14.90 | 10.65 | 0.00 | 0.00 | 17.11 | 17.58 |
| BLUE GOOSE | 0.00 | 0.00 | 14.62 | 3.55 | 0.00 | 0.00 | 17.11 | 10.99 |
| WHITE-FRONTED GOOSE | 0.00 | 0.87 | 8.89 | 8.29 | 0.00 | 15.28 | 5.99 | 8.79 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| GOOSE HARVEST (RETRIEVED KILL) | 36,339 | 50,766 | 20,472 | 22,424 | 1,908 | 5,845 | 17,224 | 20,603 |
| PERCENT CHANGE | | +40% | | +10% | | +206% | | +20% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.82 | 1.11 | 0.46 | 0.57 | 0.45 | 0.40 | 0.64 | 0.82 |
| PERCENT CHANGE | | +35% | | +24% | | -11% | | +29% |
| COOT HARVEST (RETRIEVED KILL) | 1,859 | 2,041 | 3,338 | 3,961 | 326 | 1,499 | 4,557 | 3,191 |
| PERCENT CHANGE | | +10% | | +19% | | +360% | | -30% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.04 | 0.04 | 0.05 | 0.07 | 0.04 | 0.16 | 0.09 | 0.07 |
| PERCENT CHANGE | | +2% | | +35% | | +324% | | -27% |
| TOTAL HUNTER DAYS | 287,386 | 340,741 | 388,972 | 344,001 | 40,666 | 40,672 | 362,915 | 357,159 |
| PERCENT CHANGE | | +19% | | -12% | | 0% | | -2% |
| DAYS PER ADULT HUNTER | 6.88 | 7.56 | 6.37 | 6.40 | 4.85 | 4.44 | 7.65 | 7.79 |
| PERCENT CHANGE | | +10% | | +1% | | -9% | | +2% |
| TOTAL DUCK STAMPS SOLD | 39,808 | 42,138 | 57,592 | 50,724 | 7,892 | 8,588 | 44,502 | 43,177 |
| PERCENT CHANGE | | +6% | | -12% | | +9% | | -3% |
| PERCENT SOLD TO NON-HUNTERS | 3.32% | 1.50% | 2.32% | 2.41% | 2.21% | 1.72% | 1.79% | 2.24% |
| TOTAL ADULT HUNTERS (POTENTIAL) | 38,486 | 41,506 | 56,256 | 49,502 | 7,718 | 8,440 | 43,705 | 42,210 |
| PERCENT CHANGE | | +8% | | -12% | | +9% | | -3% |
| PERCENT ACTIVE ADULT HUNTERS | 84.0% | 83.4% | 81.3% | 79.2% | 73.2% | 72.8% | 87.1% | 85.9% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 56.2% | 60.9% | 62.6% | 62.1% | 57.6% | 61.8% | 72.0% | 72.5% |
| SAMPLE SIZES | | | | | | | | |
| DUCK WINGS | 1,284 | 1,353 | 2,116 | 1,453 | 425 | 581 | 1,499 | 1,341 |
| GOOSE TAILS | 265 | 295 | 70 | 86 | 26 | 84 | 117 | 91 |
| QUESTIONNAIRES | 993 | 912 | 1,039 | 1,125 | 500 | 661 | 1,181 | 1,085 |

TABLE C-9-- PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE CENTRAL FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS --continued.

| | NEW MEXICO ^a | | NORTH DAKOTA | | OKLAHOMA | | SOUTH DAKOTA | |
|--|-------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| <u>DUCK SPECIES COMPOSITION</u> | | | | | | | | |
| MALLARD | 25.91% | 34.82% | 48.30% | 52.17% | 30.81% | 35.82% | 38.70% | 42.16% |
| DOMESTIC MALLARD | 0.20 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK DUCK | 0.00 | 0.00 | 0.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.18 | 0.00 | 0.00 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 5.35 | 6.93 | 15.48 | 15.37 | 14.95 | 19.23 | 15.81 | 14.71 |
| AMERICAN WIGEON | 5.89 | 10.77 | 7.00 | 4.00 | 9.97 | 10.62 | 7.39 | 5.30 |
| GREEN-WINGED TEAL | 25.77 | 18.56 | 8.71 | 4.82 | 18.00 | 14.37 | 14.17 | 8.30 |
| BLUE-WINGED/CINNAMON TEAL | 3.64 | 5.36 | 5.09 | 5.75 | 4.32 | 4.50 | 2.74 | 7.00 |
| NORTHERN SHOVELER | 3.51 | 4.98 | 3.29 | 4.25 | 2.52 | 2.02 | 2.30 | 6.96 |
| PINTAIL | 16.31 | 9.88 | 4.73 | 8.58 | 2.77 | 2.05 | 4.02 | 6.93 |
| WOOD DUCK | 0.00 | 0.12 | 0.25 | 0.31 | 3.32 | 3.40 | 1.66 | 0.37 |
| REDHEAD | 0.98 | 1.11 | 0.67 | 1.97 | 2.40 | 2.99 | 3.89 | 4.34 |
| CANVASBACK | 0.15 | 0.12 | 0.07 | 0.10 | 0.85 | 0.35 | 0.78 | 0.22 |
| GREATER SCAUP | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 | 0.06 | 0.00 | 0.00 |
| LESSER SCAUP | 0.00 | 0.55 | 4.66 | 1.70 | 1.97 | 1.33 | 0.42 | 1.59 |
| RING-NECKED DUCK | 0.80 | 0.56 | 0.84 | 0.24 | 6.54 | 1.18 | 2.08 | 1.03 |
| GOLDENEYES | 1.19 | 1.96 | 0.00 | 0.00 | 0.26 | 0.34 | 0.24 | 0.04 |
| BUFFLEHEAD | 0.75 | 2.51 | 0.45 | 0.55 | 0.33 | 0.86 | 1.48 | 0.26 |
| RUDDY DUCK | 0.00 | 1.04 | 0.00 | 0.12 | 0.04 | 0.21 | 0.33 | 0.63 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 |
| HOODED MERGANSERS | 0.00 | 0.51 | 0.12 | 0.00 | 0.36 | 0.43 | 0.00 | 0.08 |
| OTHER MERGANSERS | 0.40 | 0.19 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 |
| OTHER DUCKS | 1.06 | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.08 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| DUCK HARVEST (RETRIEVED KILL) | 32,965 | 37,969 | 195,597 | 430,219 | 220,371 | 155,601 | 148,944 | 420,751 |
| PERCENT CHANGE | | +15% | | +120% | | -2% | | +182% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 4.50 | 5.46 | 3.00 | 5.98 | 6.05 | 5.03 | 4.17 | 8.97 |
| PERCENT CHANGE | | +21% | | +55% | | -17% | | +115% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 13.10% | 57.22% | 23.65% | 28.41% | 60.69% | 73.58% | 40.40% | 68.74% |
| SNOW GOOSE | 84.51 | 41.92 | 46.47 | 49.67 | 19.42 | 17.80 | 22.55 | 17.31 |
| BLUE GOOSE | 1.64 | 0.00 | 26.89 | 21.56 | 13.64 | 4.34 | 34.63 | 11.06 |
| WHITE-FRONTED GOOSE | 0.00 | 0.86 | 3.00 | 0.37 | 6.25 | 4.28 | 2.42 | 2.89 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE ^b | 0.75 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 9,265 | 5,136 | 169,467 | 128,683 | 14,242 | 12,542 | 41,220 | 47,969 |
| PERCENT CHANGE | | -45% | | -24% | | -12% | | +16% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.74 | 0.67 | 2.72 | 1.80 | 0.39 | 0.41 | 1.15 | 1.08 |
| PERCENT CHANGE | | -10% | | -34% | | +7% | | -5% |
| COOT HARVEST (RETRIEVED KILL) | 262 | 1,075 | 2,503 | 8,776 | 5,883 | 2,147 | 2,060 | 11,259 |
| PERCENT CHANGE | | +310% | | +251% | | -64% | | +447% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.04 | 0.14 | 0.04 | 0.13 | 0.18 | 0.08 | 0.05 | 0.24 |
| PERCENT CHANGE | | +286% | | +227% | | -55% | | +336% |
| TOTAL HUNTER DAYS | 39,563 | 46,128 | 403,789 | 444,272 | 214,706 | 153,838 | 254,853 | 378,866 |
| PERCENT CHANGE | | +17% | | +10% | | -28% | | +49% |
| DAYS PER ADULT HUNTER | 5.54 | 6.03 | 6.70 | 6.89 | 6.61 | 5.80 | 6.91 | 8.21 |
| PERCENT CHANGE | | +9% | | +3% | | -12% | | +19% |
| TOTAL DUCK STAMPS SOLD | 6,766 | 7,321 | 57,035 | 60,147 | 30,256 | 25,642 | 34,783 | 43,415 |
| PERCENT CHANGE | | +8% | | +5% | | -15% | | +25% |
| PERCENT SOLD TO NON-HUNTERS | 2.70% | 3.76% | 2.67% | 1.27% | 1.11% | 4.69% | 2.36% | 2.04% |
| TOTAL ADULT HUNTERS (PCTENTIAL) | 6,583 | 7,046 | 55,512 | 59,383 | 29,920 | 24,439 | 33,962 | 42,529 |
| PERCENT CHANGE | | +7% | | +7% | | -18% | | +25% |
| PERCENT ACTIVE ADULT HUNTERS | 78.2% | 84.3% | 85.6% | 88.6% | 81.9% | 78.8% | 83.4% | 88.2% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 59.1% | 67.7% | 72.9% | 77.9% | 67.5% | 60.4% | 69.1% | 81.1% |
| <u>SAMPLE SIZES</u> | | | | | | | | |
| DUCK WINGS | 497 | 1,127 | 979 | 1,240 | 1,877 | 1,414 | 549 | 1,859 |
| GOOSE TAILS | 88 | 112 | 733 | 538 | 86 | 66 | 125 | 208 |
| QUESTIONNAIRES | 515 | 720 | 761 | 1,574 | 807 | 819 | 707 | 1,336 |

TABLE C-9--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE CENTRAL FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS--continued.

| | TEXAS | | WYOMING ^a | | CENTRAL FLYWAY TOTAL | |
|--|---------------|---------------|----------------------|---------------|----------------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | |
| MALLARD | 15.33% | 12.32% | 63.17% | 61.05% | 32.37% | 35.65% |
| DOMESTIC MALLARD | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.02 |
| BLACK DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| MOTTLED DUCK | 4.88 | 4.43 | 0.00 | 0.00 | 2.04 | 1.66 |
| GADWALL | 9.13 | 8.56 | 5.02 | 5.54 | 9.83 | 10.41 |
| AMERICAN WIGEON | 9.34 | 9.24 | 6.57 | 9.15 | 8.37 | 7.08 |
| GREEN-WINGED TEAL | 22.80 | 24.08 | 15.83 | 8.68 | 19.24 | 15.40 |
| BLUE-WINGED/CINNAMON TEAL | 6.75 | 8.81 | 1.31 | 2.30 | 5.54 | 7.04 |
| NORTHERN SHOVELER | 4.55 | 5.43 | 0.08 | 1.84 | 3.30 | 4.36 |
| PINTAIL | 11.96 | 13.07 | 2.69 | 5.69 | 7.38 | 8.06 |
| WOOD DUCK | 3.64 | 5.25 | 0.00 | 0.00 | 2.73 | 2.68 |
| REDHEAD | 2.01 | 1.30 | 2.17 | 0.34 | 1.71 | 1.97 |
| CANVASBACK | 0.58 | 0.36 | 0.00 | 0.11 | 0.45 | 0.24 |
| GREATER SCAUP | 0.28 | 0.13 | 0.00 | 0.00 | 0.15 | 0.06 |
| LESSER SCAUP | 5.06 | 2.44 | 0.00 | 1.14 | 3.11 | 2.00 |
| RING-NECKED DUCK | 2.58 | 3.69 | 0.31 | 0.40 | 2.57 | 1.94 |
| GOLDENEYES | 0.15 | 0.10 | 2.10 | 2.70 | 0.24 | 0.29 |
| BUFFLEHEAD | 0.40 | 0.34 | 0.50 | 0.69 | 0.50 | 0.60 |
| RUDDY DUCK | 0.15 | 0.15 | 0.00 | 0.00 | 0.13 | 0.15 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.01 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 |
| HOODED MERGANSERS | 0.23 | 0.17 | 0.00 | 0.00 | 0.15 | 0.12 |
| OTHER MERGANSERS | 0.08 | 0.05 | 0.25 | 0.36 | 0.08 | 0.10 |
| OTHER DUCKS | 0.09 | 0.07 | 0.00 | 0.00 | 0.06 | 0.05 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 1,019,600 | 1,123,067 | 42,251 | 47,935 | 2,439,569 | 2,969,153 |
| PERCENT CHANGE | | +10% | | +13% | | +22% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 7.48 | 8.29 | 4.24 | 4.60 | 5.51 | 6.61 |
| PERCENT CHANGE | | +11% | | +8% | | +20% |

GOOSE SPECIES COMPOSITION

| | | | | | | |
|---|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 13.78% | 20.54% | 100.00% | 99.19% | 30.87% | 46.27% |
| SNOW GOOSE | 43.62 | 36.96 | 0.00 | 0.00 | 37.37 | 30.51 |
| BLUE GOOSE | 22.92 | 14.98 | 0.00 | 0.00 | 22.15 | 13.05 |
| WHITE-FRONTED GOOSE | 19.57 | 27.52 | 0.00 | 0.81 | 9.55 | 10.18 |
| BRANT ^b | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GEESE | 0.11 | 0.00 | 0.00 | 0.00 | 0.06 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 201,016 | 133,286 | 3,487 | 6,760 | 514,640 | 434,014 |
| PERCENT CHANGE | | -34% | | +94% | | -16% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 1.43 | 0.95 | 0.41 | 0.54 | 1.18 | 0.99 |
| PERCENT CHANGE | | -34% | | +33% | | -17% |
| COOT HARVEST (RETRIEVED KILL) | 19,660 | 21,546 | 411 | 291 | 40,859 | 55,786 |
| PERCENT CHANGE | | +10% | | -29% | | +37% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.14 | 0.14 | 0.04 | 0.03 | 0.09 | 0.12 |
| PERCENT CHANGE | | +7% | | -36% | | +34% |
| TOTAL HUNTER DAYS | 877,018 | 835,569 | 48,697 | 51,413 | 2,919,165 | 2,992,659 |
| PERCENT CHANGE | | -5% | | +6% | | +3% |
| DAYS PER ADULT HUNTER | 6.10 | 5.66 | 5.43 | 5.21 | 6.51 | 6.57 |
| PERCENT CHANGE | | -7% | | -4% | | +1% |
| TOTAL DUCK STAMPS SOLD | 136,774 | 140,207 | 8,463 | 9,231 | 423,871 | 430,590 |
| PERCENT CHANGE | | +3% | | +9% | | +2% |
| PERCENT SOLD TO NON-HUNTERS | 3.08% | 3.40% | 2.33% | 1.58% | 2.57% | 2.56% |
| TOTAL ADULT HUNTERS (POTENTIAL) | 132,561 | 135,440 | 8,266 | 9,085 | 412,569 | 419,580 |
| PERCENT CHANGE | | +2% | | +10% | | +2% |
| PERCENT ACTIVE ADULT HUNTERS | 81.9% | 80.9% | 80.1% | 82.7% | 82.9% | 83.1% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 69.8% | 67.4% | 62.8% | 67.1% | 67.4% | 69.0% |
| <u>SAMPLE SIZES</u> | | | | | | |
| DUCK WINGS | 6,558 | 4,407 | 624 | 946 | 16,408 | 15,721 |
| GOOSE TAILS | 874 | 459 | 29 | 95 | 2,413 | 2,034 |
| QUESTIONNAIRES | 1,940 | 2,099 | 641 | 592 | 9,084 | 10,923 |

^aIncludes only that portion of the State lying within the Central Flyway.
^bRoss' Goose.

TABLE C-10--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE PACIFIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS.

| | ARIZONA | | CALIFORNIA | | COLORADO ^a | | IDAHO | |
|--|---------------|---------------|---------------|---------------|-----------------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 10.28% | 16.00% | 16.72% | 15.85% | 69.65% | 74.29% | 63.09% | 66.75% |
| DOMESTIC MALLARD | 0.46 | 7.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 2.16 | 5.69 | 1.59 | 2.11 | 1.26 | 2.55 | 2.60 | 2.27 |
| AMERICAN WIGEON | 5.48 | 7.99 | 11.82 | 9.66 | 2.21 | 5.03 | 9.46 | 10.58 |
| GREEN-WINGED TEAL | 34.77 | 25.28 | 22.31 | 21.81 | 18.39 | 11.58 | 10.51 | 7.86 |
| BLUE-WINGED/CINNAMON TEAL | 11.32 | 2.90 | 3.26 | 3.50 | 2.18 | 0.92 | 2.17 | 0.62 |
| NORTHERN SHOVELER | 3.25 | 9.44 | 8.40 | 8.67 | 0.40 | 0.61 | 1.30 | 1.58 |
| PINTAIL | 15.12 | 13.48 | 25.56 | 32.10 | 0.36 | 1.65 | 4.73 | 4.76 |
| WOOD DUCK | 0.00 | 0.19 | 1.77 | 1.56 | 0.00 | 0.00 | 0.25 | 0.68 |
| REDHEAD | 3.39 | 2.56 | 0.51 | 0.44 | 0.18 | 0.24 | 0.66 | 0.66 |
| CANVASBACK | 0.07 | 1.08 | 1.63 | 0.76 | 0.18 | 0.00 | 0.30 | 0.08 |
| GREATER SCAUP | 0.30 | 0.05 | 1.66 | 0.12 | 0.36 | 0.00 | 0.00 | 0.00 |
| LESSER SCAUP | 0.41 | 1.50 | 1.98 | 0.82 | 0.00 | 0.14 | 0.12 | 0.41 |
| RING-NECKED DUCK | 5.23 | 3.72 | 0.64 | 0.82 | 0.00 | 0.65 | 0.28 | 0.13 |
| GOLDENEYES | 0.29 | 1.65 | 0.32 | 0.09 | 2.60 | 1.05 | 2.90 | 2.81 |
| BUFFLEHEAD | 1.09 | 2.86 | 0.42 | 0.46 | 0.36 | 0.47 | 0.56 | 0.26 |
| RUDDY DUCK | 5.54 | 4.75 | 2.47 | 0.70 | 0.00 | 0.00 | 0.31 | 0.17 |
| OLDSQUAN | 0.00 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.00 | 0.00 | 0.46 | 0.22 | 0.00 | 0.00 | 0.00 | 0.00 |
| HOODED MERGANSERS | 0.00 | 0.09 | 0.00 | 0.07 | 0.00 | 0.00 | 0.15 | 0.05 |
| OTHER MERGANSERS | 0.00 | 0.68 | 0.04 | 0.16 | 1.87 | 0.82 | 0.61 | 0.33 |
| OTHER DUCKS | 0.23 | 0.00 | 0.23 | 0.05 | 0.00 | 0.00 | 0.00 | 0.00 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 55,486 | 62,740 | 1,373,451 | 1,857,146 | 27,589 | 43,874 | 223,461 | 331,107 |
| PERCENT CHANGE | | +13% | | +35% | | +59% | | +48% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 5.39 | 5.25 | 10.79 | 15.19 | 4.58 | 5.33 | 5.63 | 8.02 |
| PERCENT CHANGE | | -3% | | +41% | | +16% | | +42% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|-------------------------|---------------|---------------|---------------|---------------|-------------|---------------|---------------|---------------|
| CANADA GOOSE | 73.80% | 94.99% | 25.51% | 41.23% | 0.00% | 100.00% | 100.00% | 100.00% |
| SNOW GOOSE | 17.47 | 5.01 | 46.56 | 25.32 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 8.73 | 0.00 | 20.10 | 30.76 | 0.00 | 0.00 | 0.00 | 0.00 |
| BRANT | 0.00 | 0.00 | 5.81 | 0.60 | 0.00 | 0.00 | 0.00 | 0.00 |
| OTHER GESE ^b | 0.00 | 0.00 | 2.03 | 2.09 | 0.00 | 0.00 | 0.00 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>0.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |

| | | | | | | | | |
|--------------------------------|-------|-------|---------|---------|---|--------|--------|--------|
| GOOSE HARVEST (RETRIEVED KILL) | 1,721 | 2,235 | 167,044 | 112,865 | 0 | 1,268 | 23,785 | 37,409 |
| PERCENT CHANGE | | +30% | | -32% | | 00024% | | +57% |

| | | | | | | | | |
|---|------|------|------|------|------|------|------|------|
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.11 | 0.21 | 1.32 | 0.93 | 0.20 | 0.22 | 0.57 | 1.12 |
| PERCENT CHANGE | | +84% | | -29% | | +8% | | +56% |

| | | | | | | | | |
|-------------------------------|-------|-------|--------|--------|-----|------|-------|-------|
| COOT HARVEST (RETRIEVED KILL) | 2,100 | 1,714 | 50,088 | 61,536 | 323 | 261 | 8,550 | 4,417 |
| PERCENT CHANGE | | -18% | | +23% | | -19% | | -49% |

| | | | | | | | | |
|--|------|------|------|------|------|------|------|------|
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.19 | 0.14 | 0.38 | 0.48 | 0.06 | 0.04 | 0.23 | 0.11 |
| PERCENT CHANGE | | -26% | | +27% | | -23% | | -52% |

| | | | | | | | | |
|-------------------|--------|--------|-----------|-----------|--------|--------|---------|---------|
| TOTAL HUNTER DAYS | 54,603 | 61,934 | 1,041,052 | 1,029,278 | 27,380 | 34,785 | 233,432 | 287,152 |
| PERCENT CHANGE | | +13% | | -1% | | +27% | | +23% |

| | | | | | | | | |
|-----------------------|------|------|------|------|------|------|------|------|
| DAYS PER ADULT HUNTER | 4.87 | 4.98 | 7.94 | 8.10 | 4.80 | 5.80 | 6.22 | 7.13 |
| PERCENT CHANGE | | +2% | | +2% | | +21% | | +15% |

| | | | | | | | | |
|------------------------|--------|--------|---------|---------|-------|-------|--------|--------|
| TOTAL DUCK STAMPS SOLD | 10,566 | 11,735 | 128,280 | 126,091 | 5,423 | 5,598 | 35,484 | 38,051 |
| PERCENT CHANGE | | +11% | | -2% | | +3% | | +7% |

| | | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT SOLD TO NON-HUNTERS | 2.38% | 2.49% | 6.02% | 7.31% | 3.32% | 1.50% | 2.63% | 2.69% |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|

| | | | | | | | | |
|---------------------------------|--------|--------|---------|---------|-------|-------|--------|--------|
| TOTAL ADULT HUNTERS (PCTENTIAL) | 10,315 | 11,443 | 120,558 | 116,874 | 5,243 | 5,514 | 34,551 | 37,027 |
| PERCENT CHANGE | | +11% | | -3% | | +5% | | +7% |

| | | | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT ACTIVE ADULT HUNTERS | 77.6% | 78.1% | 86.2% | 87.4% | 78.6% | 83.1% | 81.1% | 81.9% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 59.3% | 59.3% | 71.7% | 77.6% | 60.2% | 68.5% | 66.1% | 69.0% |

SAMPLE SIZES

| | | | | | | | | |
|----------------|-------|-------|-------|-------|-----|-----|-------|-------|
| DUCK WINGS | 1,123 | 1,063 | 4,356 | 5,931 | 458 | 512 | 1,357 | 1,780 |
| GOOSE TAILS | 7 | 20 | 369 | 339 | 0 | 3 | 89 | 155 |
| QUESTIONNAIRES | 725 | 735 | 2,735 | 3,175 | 418 | 546 | 677 | 1,046 |

TABLE C-10--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE PACIFIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS --continued.

| | MONTANA ^a | | NEVADA | | NEW MEXICO ^a | | OREGON | |
|--|----------------------|---------------|---------------|---------------|-------------------------|---------------|---------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 64.84% | 53.87% | 20.92% | 29.43% | 36.68% | 38.07% | 37.91% | 32.55% |
| DOMESTIC MALLARD | 0.10 | 0.00 | 0.14 | 0.08 | 0.00 | 0.00 | 0.00 | 0.26 |
| BLACK DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 3.44 | 8.69 | 7.09 | 7.35 | 10.15 | 11.45 | 3.12 | 3.57 |
| AMERICAN WIGEON | 6.78 | 5.14 | 9.78 | 6.64 | 21.65 | 23.50 | 18.32 | 18.56 |
| GREEN-WINGED TEAL | 6.80 | 5.45 | 25.48 | 21.44 | 8.60 | 9.26 | 13.93 | 15.40 |
| BLUE-WINGED/CINNAMON TEAL | 1.28 | 3.73 | 5.42 | 1.86 | 0.00 | 1.84 | 0.80 | 0.23 |
| NORTHERN SHOVELER | 3.14 | 3.57 | 5.86 | 5.76 | 0.77 | 0.60 | 3.28 | 2.32 |
| PINTAIL | 5.39 | 9.49 | 16.53 | 15.87 | 0.77 | 1.21 | 12.78 | 16.81 |
| WOOD DUCK | 0.77 | 0.69 | 0.14 | 0.63 | 0.00 | 0.00 | 3.26 | 2.16 |
| REDHEAD | 0.84 | 1.09 | 2.26 | 4.35 | 1.84 | 1.21 | 0.45 | 0.53 |
| CANVASBACK | 0.68 | 1.21 | 0.71 | 2.66 | 1.45 | 0.60 | 0.65 | 1.25 |
| GREATER SCAUP | 0.00 | 0.16 | 0.14 | 0.00 | 0.00 | 0.00 | 0.71 | 0.24 |
| LESSER SCAUP | 3.52 | 2.29 | 1.27 | 0.82 | 0.00 | 0.60 | 0.57 | 1.41 |
| RING-NECKED DUCK | 0.16 | 0.88 | 1.13 | 0.85 | 2.74 | 1.21 | 0.79 | 1.70 |
| GOLDENEYES | 1.61 | 1.14 | 0.85 | 0.08 | 4.26 | 4.22 | 0.73 | 0.22 |
| BUFFLEHEAD | 0.22 | 1.61 | 0.71 | 1.13 | 1.16 | 5.03 | 1.84 | 2.20 |
| RUDDY DUCK | 0.00 | 0.36 | 0.59 | 0.63 | 0.00 | 0.00 | 0.39 | 0.17 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 |
| HOODED Mergansers | 0.16 | 0.10 | 0.00 | 0.14 | 0.00 | 0.00 | 0.07 | 0.25 |
| OTHER Mergansers | 0.16 | 0.26 | 0.57 | 0.28 | 6.41 | 1.21 | 0.37 | 0.00 |
| OTHER DUCKS | 0.00 | 0.00 | 0.00 | 0.00 | 3.52 | 0.00 | 0.00 | 0.05 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 139,617 | 143,698 | 76,858 | 88,457 | 4,553 | 11,320 | 361,787 | 505,746 |
| PERCENT CHANGE | | +3% | | +15% | | +149% | | +40% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 6.27 | 6.36 | 6.07 | 7.54 | 2.84 | 11.39 | 6.36 | 9.28 |
| PERCENT CHANGE | | +2% | | +24% | | +301% | | +46% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|---|---------------|---------------|---------------|---------------|-------------|-------------|---------------|---------------|
| CANADA GOOSE | 85.68% | 90.61% | 85.37% | 90.70% | 0.00% | 0.00% | 96.40% | 97.79% |
| SNOW GOOSE | 8.02 | 9.39 | 14.63 | 9.30 | 0.00 | 0.00 | 2.40 | 0.00 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 2.21 |
| BRANT | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 |
| OTHER GESE ^b | 6.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>0.00</u> | <u>0.00</u> | <u>100.00</u> | <u>100.00</u> |
| GOOSE HARVEST (RETRIEVED KILL) | 6,281 | 8,639 | 4,319 | 6,463 | 0 | 0 | 45,518 | 66,616 |
| PERCENT CHANGE | | +4% | | +50% | | 0% | | +46% |
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.40 | 0.39 | 0.42 | 0.56 | 0.26 | 0.08 | 0.79 | 1.21 |
| PERCENT CHANGE | | 0% | | +34% | | -71% | | +52% |
| COOT HARVEST (RETRIEVED KILL) | 19,631 | 2,268 | 3,526 | 2,551 | 77 | 57 | 9,771 | 6,682 |
| PERCENT CHANGE | | -88% | | -28% | | -26% | | -32% |
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.84 | 0.10 | 0.30 | 0.20 | 0.07 | 0.05 | 0.16 | 0.12 |
| PERCENT CHANGE | | -88% | | -34% | | -22% | | -29% |
| TOTAL HUNTER DAYS | 127,240 | 135,805 | 69,134 | 68,805 | 4,657 | 8,261 | 377,530 | 397,544 |
| PERCENT CHANGE | | +7% | | 0% | | +77% | | +5% |
| DAYS PER ADULT HUNTER | 5.45 | 5.83 | 5.83 | 5.32 | 4.20 | 7.80 | 6.36 | 6.96 |
| PERCENT CHANGE | | +7% | | -9% | | +86% | | +10% |
| TOTAL DUCK STAMPS SOLD | 21,966 | 21,813 | 11,145 | 12,154 | 1,048 | 1,012 | 56,224 | 54,847 |
| PERCENT CHANGE | | -1% | | +9% | | -3% | | -2% |
| PERCENT SOLD TO NON-HUNTERS | 2.21% | 1.72% | 2.12% | 2.19% | 2.70% | 3.76% | 2.80% | 4.22% |
| TOTAL ADULT HUNTERS (PCTENTIAL) | 21,481 | 21,438 | 10,909 | 11,888 | 1,020 | 974 | 54,650 | 52,532 |
| PERCENT CHANGE | | 0% | | +9% | | -5% | | -4% |
| PERCENT ACTIVE ADULT HUNTERS | 80.7% | 81.7% | 79.6% | 78.0% | 69.9% | 84.3% | 82.1% | 84.1% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 67.3% | 67.0% | 61.8% | 64.1% | 44.5% | 70.8% | 64.0% | 68.1% |
| <u>SAMPLE SIZES</u> | | | | | | | | |
| DUCK WINGS | 1,007 | 1,393 | 651 | 836 | 170 | 176 | 1,664 | 1,450 |
| GOOSE TAILS | 68 | 78 | 41 | 43 | 0 | 0 | 167 | 227 |
| QUESTIONNAIRES | 601 | 639 | 745 | 762 | 91 | 64 | 1,035 | 1,369 |

TABLE C-10--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN THE PACIFIC FLYWAY DURING THE 1977 AND 1978 HUNTING SEASONS --continued.

| | UTAH | | WASHINGTON | | WYOMING ^a | | PACIFIC FLYWAY TOTAL | |
|--|---------------|---------------|---------------|---------------|----------------------|---------------|----------------------|---------------|
| | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 | 1977 | 1978 |
| DUCK SPECIES COMPOSITION | | | | | | | | |
| MALLARD | 23.59% | 33.33% | 49.78% | 54.11% | 62.31% | 63.83% | 32.03% | 31.84% |
| DOMESTIC MALLARD | 0.00 | 0.00 | 0.05 | 0.03 | 0.00 | 0.00 | 0.03 | 0.04 |
| BLACK DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| GADWALL | 10.38 | 10.26 | 0.77 | 1.54 | 6.12 | 2.56 | 2.82 | 3.36 |
| AMERICAN WIGEON | 6.92 | 4.53 | 14.85 | 11.00 | 5.62 | 8.15 | 12.10 | 10.35 |
| GREEN-WINGED TEAL | 17.98 | 18.56 | 14.98 | 13.59 | 9.92 | 14.75 | 18.29 | 17.64 |
| BLUE-WINGED/CINNAMON TEAL | 5.15 | 1.87 | 0.26 | 0.11 | 2.26 | 2.87 | 2.58 | 2.14 |
| NORTHERN SHOVELER | 4.59 | 2.88 | 2.68 | 1.72 | 0.00 | 2.05 | 5.43 | 5.40 |
| PINTAIL | 17.41 | 15.44 | 10.83 | 11.32 | 4.96 | 2.05 | 17.54 | 21.43 |
| WOOD DUCK | 0.00 | 0.37 | 0.14 | 0.24 | 0.00 | 0.00 | 1.25 | 1.17 |
| REDHEAD | 4.38 | 4.16 | 0.16 | 0.43 | 0.00 | 1.23 | 0.86 | 0.93 |
| CANVASBACK | 1.48 | 0.92 | 0.29 | 0.41 | 0.00 | 0.41 | 1.05 | 0.78 |
| GREATER SCAUP | 0.14 | 0.09 | 0.54 | 0.63 | 0.00 | 0.41 | 0.95 | 0.20 |
| LESSER SCAUP | 2.40 | 0.92 | 0.62 | 1.17 | 0.00 | 0.41 | 1.47 | 0.97 |
| RING-NECKED DUCK | 0.00 | 0.28 | 0.86 | 0.45 | 0.00 | 0.41 | 0.65 | 0.82 |
| GOLDENEYES | 1.06 | 3.61 | 0.82 | 0.66 | 6.61 | 0.82 | 0.82 | 0.80 |
| BUFFLEHEAD | 1.62 | 0.74 | 1.31 | 1.77 | 1.10 | 0.00 | 0.87 | 0.99 |
| RUDDY DUCK | 2.26 | 1.39 | 0.23 | 0.52 | 0.00 | 0.00 | 0.62 | 0.66 |
| OLDSQUAW | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.02 |
| EIDERS | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| SCOTERS | 0.07 | 0.00 | 0.14 | 0.10 | 0.00 | 0.00 | 0.24 | 0.13 |
| HOODED MERGANSERS | 0.07 | 0.00 | 0.43 | 0.03 | 0.00 | 0.00 | 0.11 | 0.08 |
| OTHER MERGANSERS | 0.49 | 0.64 | 0.24 | 0.08 | 1.10 | 0.00 | 0.24 | 0.21 |
| OTHER DUCKS | 0.00 | 0.00 | 0.03 | 0.05 | 0.00 | 0.00 | 0.03 | 0.04 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| DUCK HARVEST (RETRIEVED KILL) | 242,276 | 337,671 | 565,420 | 577,852 | 10,016 | 15,743 | 3,084,514 | 3,975,354 |
| PERCENT CHANGE | | +39% | | +1% | | +57% | | +29% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 6.30 | 8.83 | 8.05 | 7.96 | 5.12 | 5.60 | 7.95 | 10.31 |
| PERCENT CHANGE | | +40% | | -1% | | +9% | | +30% |

GOOSE SPECIES COMPOSITION

| | | | | | | | | |
|--------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 94.52% | 100.00% | 96.11% | 96.28% | 100.00% | 100.00% | 58.53% | 77.93% |
| SNOW GOOSE | 4.11 | 0.00 | 0.78 | 1.33 | 0.00 | 0.00 | 25.86 | 9.53 |
| BLUE GOOSE | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| WHITE-FRONTED GOOSE | 1.37 | 0.00 | 0.78 | 1.06 | 0.00 | 0.00 | 10.86 | 11.35 |
| BRANT | 0.00 | 0.00 | 2.33 | 1.33 | 0.00 | 0.00 | 3.43 | 0.46 |
| OTHER GEESE ^b | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.32 | 0.73 |
| TOTAL | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

| | | | | | | | | |
|--------------------------------|--------|--------|--------|--------|-------|-------|---------|---------|
| GOOSE HARVEST (RETRIEVED KILL) | 26,556 | 25,917 | 37,263 | 61,928 | 1,562 | 1,189 | 316,449 | 324,529 |
| PERCENT CHANGE | | -2% | | +66% | | -35% | | +3% |

| | | | | | | | | |
|---|------|------|------|------|------|------|------|------|
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.69 | 0.68 | 0.52 | 0.80 | 0.42 | 0.47 | 0.82 | 0.86 |
| PERCENT CHANGE | | -2% | | +54% | | +12% | | +5% |

| | | | | | | | | |
|-------------------------------|-------|--------|--------|-------|-----|-----|---------|---------|
| COOT HARVEST (RETRIEVED KILL) | 8,390 | 14,841 | 10,252 | 5,931 | 135 | 123 | 112,883 | 100,381 |
| PERCENT CHANGE | | +77% | | -42% | | -9% | | -11% |

| | | | | | | | | |
|--|------|------|------|------|------|------|------|------|
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.19 | 0.36 | 0.14 | 0.08 | 0.05 | 0.04 | 0.28 | 0.25 |
| PERCENT CHANGE | | +88% | | -42% | | -16% | | -10% |

| | | | | | | | | |
|-------------------|---------|---------|---------|---------|--------|--------|-----------|-----------|
| TOTAL HUNTER DAYS | 333,495 | 299,240 | 539,637 | 501,172 | 13,569 | 13,906 | 2,821,769 | 2,837,882 |
| PERCENT CHANGE | | -10% | | -7% | | +2% | | +1% |

| | | | | | | | | |
|-----------------------|------|------|------|------|------|------|------|------|
| DAYS PER ADULT HUNTER | 7.64 | 7.30 | 7.31 | 6.81 | 5.16 | 4.81 | 7.03 | 7.14 |
| PERCENT CHANGE | | -4% | | -7% | | -7% | | +2% |

| | | | | | | | | |
|------------------------|--------|--------|--------|--------|-------|-------|---------|---------|
| TOTAL DUCK STAMPS SOLD | 40,319 | 38,091 | 70,261 | 69,210 | 2,479 | 2,700 | 383,195 | 381,302 |
| PERCENT CHANGE | | -6% | | -1% | | +9% | | 0% |

| | | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT SOLD TO NON-HUNTERS | 0.37% | 1.02% | 3.21% | 2.23% | 2.33% | 1.58% | 3.64% | 4.05% |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|

| | | | | | | | | |
|---------------------------------|--------|--------|--------|--------|-------|-------|---------|---------|
| TOTAL ADULT HUNTERS (PCTENTIAL) | 40,170 | 37,702 | 67,935 | 67,667 | 2,421 | 2,657 | 369,253 | 365,716 |
| PERCENT CHANGE | | -6% | | 0% | | +10% | | -1% |

| | | | | | | | | |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| PERCENT ACTIVE ADULT HUNTERS | 88.8% | 88.2% | 83.7% | 82.2% | 78.6% | 79.4% | 84.0% | 84.4% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 71.9% | 73.6% | 68.0% | 68.3% | 64.7% | 62.0% | 68.2% | 71.3% |

SAMPLE SIZES

| | | | | | | | | |
|----------------|-------|-------|-------|-------|-----|-----|--------|--------|
| DUCK WINGS | 1,417 | 1,098 | 3,251 | 3,689 | 171 | 196 | 15,625 | 18,124 |
| GOOSE TAILS | 73 | 100 | 255 | 370 | 27 | 11 | 1,095 | 1,346 |
| QUESTIONNAIRES | 651 | 638 | 1,300 | 1,546 | 146 | 216 | 9,124 | 10,736 |

^aIncludes only that portion of the State lying within the Pacific Flyway.

^bRoss' Goose.

TABLE C-11--PERCENTAGE SPECIES COMPOSITION OF WATERFOWL HARVESTED, TOTAL NUMBERS HARVESTED, AND ADULT HUNTER STATISTICS IN ALASKA AND FOR THE ENTIRE UNITED STATES DURING THE 1977 AND 1978 HUNTING SEASONS.

| | ALASKA | | UNITED STATES TOTAL | |
|--|---------------|---------------|------------------------|---------------|
| | 1977 | 1978 | 1977 | 1978 |
| <u>DUCK SPECIES COMPOSITION</u> | | | | |
| MALLARD | 29.71% | 32.86% | 33.17% | 32.99% |
| DOMESTIC MALLARD | 0.00 | 0.00 | 0.11 | 0.10 |
| BLACK DUCK | 0.00 | 0.00 | 2.04 | 2.20 |
| BLACK X MALLARD | 0.00 | 0.00 | 0.11 | 0.14 |
| MOTTLED DUCK | 0.00 | 0.00 | 0.60 | 0.78 |
| GADWALL | 0.65 | 0.47 | 5.48 | 6.36 |
| AMERICAN WIGEON | 11.00 | 13.08 | 6.66 | 6.86 |
| GREEN-WINGED TEAL | 15.71 | 14.68 | 13.84 | 13.00 |
| BLUE-WINGED/CINNAMON TEAL | 0.61 | 0.09 | 5.46 | 6.30 |
| NORTHERN SHOVELER | 5.41 | 4.16 | 2.86 | 3.49 |
| PINTAIL | 24.83 | 15.20 | 7.51 | 8.83 |
| WOOD DUCK | 0.00 | 0.00 | 7.62 | 8.31 |
| REDHEAD | 0.20 | 3.09 | 0.78 | 1.09 |
| CANVASBACK | 0.40 | 0.26 | 0.56 | 0.42 |
| GREATER SCAUP | 1.32 | 1.82 | 0.58 | 0.40 |
| LESSER SCAUP | 2.12 | 1.47 | 5.10 | 2.06 |
| RING-NECKED DUCK | 0.35 | 0.19 | 3.25 | 3.38 |
| GOLDENEYES | 3.73 | 3.58 | 0.57 | 0.65 |
| BUFFLEHEAD | 2.58 | 4.35 | 1.14 | 1.07 |
| RUDDY DUCK | 0.00 | 0.00 | 0.29 | 0.42 |
| OLDSQUAW | 0.50 | 1.29 | 0.07 | 0.06 |
| EIDERS | 0.15 | 0.00 | 0.11 | 0.10 |
| SCOTERS | 0.25 | 4.27 | 0.50 | 0.30 |
| HOODED MERGANSERS | 0.00 | 0.00 | 0.52 | 0.46 |
| OTHER MERGANSERS | 0.05 | 0.49 | 0.23 | 0.17 |
| OTHER DUCKS | 0.42 | 1.64 | 0.04 | 0.05 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |
| DUCK HARVEST (RETRIEVED KILL) | 108,326 | 124,107 | 13,470,295 | 15,354,528 |
| PERCENT CHANGE | | +15% | | +14% |
| SEASONAL DUCK HARVEST PER ADULT HUNTER | 5.49 | 6.30 | 6.21 | 7.11 |
| PERCENT CHANGE | | +15% | | +15% |

GOOSE SPECIES COMPOSITION

| | | | | |
|--------------------------|---------------|---------------|---------------|---------------|
| CANADA GOOSE | 64.87% | 64.42% | 64.06% | 70.95% |
| SNOW GOOSE | 3.60 | 3.60 | 18.57 | 13.67 |
| BLUE GOOSE | 0.00 | 0.00 | 10.67 | 8.16 |
| WHITE-FRONTED GOOSE | 7.21 | 8.30 | 5.62 | 6.75 |
| BRANT | 11.71 | 5.33 | 0.73 | 0.16 |
| OTHER GEESE ^a | 12.61 | 21.35 | 0.36 | 0.31 |
| <u>TOTAL</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> |

| | | | | |
|--------------------------------|--------|--------|-----------|-----------|
| GOOSE HARVEST (RETRIEVED KILL) | 16,530 | 14,096 | 1,839,806 | 1,713,448 |
| PERCENT CHANGE | | -15% | | -7% |

| | | | | |
|---|------|------|------|------|
| SEASONAL GOOSE HARVEST PER ADULT HUNTER | 0.86 | 0.73 | 0.86 | 0.80 |
| PERCENT CHANGE | | -16% | | -7% |

| | | | | |
|-------------------------------|-----|------|---------|---------|
| COOT HARVEST (RETRIEVED KILL) | 438 | 573 | 492,217 | 641,680 |
| PERCENT CHANGE | | +31% | | +30% |

| | | | | |
|--|------|------|------|------|
| SEASONAL COOT HARVEST PER ADULT HUNTER | 0.02 | 0.03 | 0.22 | 0.29 |
| PERCENT CHANGE | | +29% | | +31% |

| | | | | |
|-------------------|--------|--------|------------|------------|
| TOTAL HUNTER DAYS | 86,042 | 97,838 | 15,249,555 | 15,629,168 |
| PERCENT CHANGE | | +14% | | +2% |

| | | | | |
|-----------------------|------|------|------|------|
| DAYS PER ADULT HUNTER | 4.18 | 4.72 | 6.87 | 7.07 |
| PERCENT CHANGE | | +13% | | +3% |

| | | | | |
|------------------------|--------|--------|-----------|-----------|
| TOTAL DUCK STAMPS SOLD | 19,253 | 19,689 | 2,132,940 | 2,131,756 |
| PERCENT CHANGE | | +2% | | 0% |

| | | | | |
|-----------------------------|-------|-------|-------|-------|
| PERCENT SOLD TO NON-HUNTERS | 1.73% | 3.08% | 2.94% | 3.35% |
|-----------------------------|-------|-------|-------|-------|

| | | | | |
|---------------------------------|--------|--------|-----------|-----------|
| TOTAL ADULT HUNTERS (PCTENTIAL) | 18,920 | 19,083 | 2,070,201 | 2,060,455 |
| PERCENT CHANGE | | +1% | | 0% |

| | | | | |
|----------------------------------|-------|-------|-------|-------|
| PERCENT ACTIVE ADULT HUNTERS | 70.0% | 73.2% | 85.1% | 85.4% |
| PERCENT SUCCESSFUL ADULT HUNTERS | 56.7% | 58.8% | 67.6% | 69.7% |

SAMPLE SIZES

| | | | | |
|----------------|-------|-------|--------|--------|
| DUCK WINGS | 1,647 | 1,565 | 72,398 | 71,816 |
| GOOSE TAILS | 222 | 163 | 8,553 | 7,239 |
| QUESTIONNAIRES | 1,192 | 1,491 | 42,119 | 49,451 |

^aRoss' goose in Central and Pacific Flyways; Emperor goose in Alaska.

Table C-12. Numbers of teal harvested (retrieved kill), with percent species composition, during the 1977 and 1978 September teal seasons.

| Flyway/State | 1977 | | | | 1978 | | | |
|---------------------|-------------------|---------------------------|-----------------------------------|----------------|-------------------|---------------------------|-----------------------------------|----------------|
| | Numbers harvested | Percent green-winged teal | Percent blue-winged/cinnamon teal | Wings received | Numbers harvested | Percent green-winged teal | Percent blue-winged/cinnamon teal | Wings received |
| Mississippi Flyway | | | | | | | | |
| Alabama | 2,700 | 5.3 | 94.7 | 75 | 3,300 | 4.8 | 95.2 | 125 |
| Arkansas | 13,400 | 55.6 | 44.4 | 9 | 8,200 | 6.3 | 93.7 | 63 |
| Illinois | 16,600 | 21.8 | 78.2 | 78 | 24,000 | 11.4 | 88.6 | 132 |
| Indiana | 4,200 | 21.3 | 78.7 | 188 | 4,000 | 7.8 | 92.2 | 180 |
| Kentucky | 600 | | 100.0 | 8 | 700 | 8.3 | 91.7 | 24 |
| Louisiana | 101,100 | 18.1 | 81.9 | 364 | 154,400 | 7.7 | 92.3 | 441 |
| Mississippi | 3,200 | 9.5 | 90.5 | 42 | 3,200 | 7.5 | 92.5 | 67 |
| Missouri | 11,500 | 12.0 | 88.0 | 50 | 14,100 | 7.6 | 92.4 | 131 |
| Ohio | 4,900 | 21.2 | 78.8 | 170 | 6,100 | 14.8 | 85.2 | 149 |
| Tennessee | 2,900 | | 100.0 | 1 | 5,900 | 12.9 | 87.1 | 62 |
| Total | 161,200 | 20.6 | 79.4 | 985 | 224,000 | 8.3 | 91.7 | 1,374 |
| Central Flyway | | | | | | | | |
| Colorado | 9,500 | 64.8 | 35.2 | 71 | 10,200 | 21.3 | 78.7 | 47 |
| Kansas | 32,600 | 25.8 | 74.2 | 221 | 24,500 | 11.5 | 88.5 | 183 |
| New Mexico | 1,800 | 55.6 | 44.4 | 36 | 2,100 | 30.1 | 69.9 | 143 |
| Oklahoma | 7,000 | 19.6 | 80.4 | 163 | 6,100 | 16.7 | 83.3 | 192 |
| Texas | 51,500 | 14.6 | 85.4 | 727 | 68,300 | 14.3 | 85.7 | 512 |
| Total | 102,400 | 23.9 | 76.1 | 1,218 | 111,200 | 14.7 | 85.3 | 1,077 |
| United States total | | | | | | | | |
| | 263,600 | 21.9 | 78.1 | 2,203 | 335,200 | 10.4 | 89.6 | 2,451 |

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A list of current *Special Scientific Report – Wildlife* follows.

225. Scalation of the American Alligator, by Charles A. Ross and Charles D. Roberts. 1979. 8 pp.

(Reports 226 and 227 are in one cover)

226. Waterfowl Status Report, 1975, compiled and edited by James R. Goldsberry, Sharon L. Rhoades, Lonnie D. Schroeder, and Morton M. Smith. 1980. 86 pp.

227. Waterfowl Status Report, 1976, compiled and edited by William W. Larned, Sharon L. Rhoades, and K. Duane Norman. 1980. 88 pp.

228. Effects of Environmental Contaminants on Reptiles: A Review, by Russell J. Hall. 1980. 12 pp.

229. The Rocky Mountain Population of the Western Canada Goose: Its Distribution, Habitats, and Management, by William B. Krohn and Elwood G. Bizeau. 1980. 93 pp.

230. Breeding Biology and Relation of Pollutants to Black Skimmers and Gull-billed Terns in South Carolina, by Lawrence J. Blus and Charles J. Stafford. 1980. 18 pp.

231. The Canada Goose (*Branta canadensis*) – An Annotated Bibliography, compiled by Scott R. Craven. 1981. 66 pp.

232. Metabolism of Pesticides: Update III, by Calvin M. Menzie. 1980. 709 pp.

233. Relative Attractiveness of Different Foods at Wild Bird Feeders, by Aelred D. Geis. 1980. 11 pp.

234. Establishment of Seeded Grasslands for Wildlife Habitat in the Prairie Pothole Region, by Harold F. Duebber, Erling T. Jacobson, Kenneth E. Higgins, and Erling B. Podoll. 1981. 21 pp.

235. Bats and Environmental Contaminants: A Review, by Donald R. Clark, Jr. 1981. 27 pp.

(Reports 236 and 237 are in one cover)

236. Waterfowl Status Report, 1977, compiled and edited by Carey S. Smith, Sharon L. Rhoades, and K. Duane Norman. 1981. 88 pp.

237. Waterfowl Status Report, 1978, compiled and edited by Albert N. Novara, Sharon L. Rhoades, Betty I. Hodges, and K. Duane Norman. 1981. 96 pp.

238. Status Reports on Twelve Raptors, by David L. Evans. 1982. 68 pp.

239. Summary of Foreign Game Bird Liberations, 1969–78, by Richard C. Banks. 1981. 23 pp.

240. Reliability of Kill and Activity Estimates in the U.S. Waterfowl Hunter Survey, by Leigh M. Couling, A. R. Sen, and Elwood M. Martin. 1982. 14 pp.

241. Residues of DDT, Dieldrin, and Heptachlor in Earthworms During Two Years Following Application, by Charles D. Gish and Donald L. Hughes. 1982. 15 pp.

242. Changes in Vegetation Structure in Seeded Nesting Cover in the Prairie Pothole Region, by Kenneth F. Higgins and William T. Barker. 1982. 26 pp.

243. Bibliography of References to Avian Botulism: Update, by Sonoma S. Wilson and Louis N. Locke. 1982. 10 pp.

244. Technique for Structuring Wildlife Guilds to Evaluate Impacts on Wildlife Communities, by Henry L. Short and Kenneth P. Burnham. 1982. 34 pp.

245. Organochlorine Residues in Eggs of Alaskan Seabirds, by Harry M. Ohlendorf and others. 1982. 41 pp.

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As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.



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